# ARITHMETIC
## BY
# PRACTICE

## FOURTH YEAR - SECOND HALF

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GORTON - LYNCH - MURRAY

SIMMONS-PECKHAM CO., INC.

# ARITHMETIC BY PRACTICE

## *FOURTH YEAR—SECOND HALF*

BY

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# PREFACE

THIS series of arithmetics has been prepared by the authors to cover certain essential requirements in the teaching of arithmetic.

To secure efficiency in arithmetic it is necessary:

*First.* That pupils have a thorough knowledge of the fundamental processes.

*Second.* That the formal facts of arithmetic, such as the multiplication tables, denominate number tables, and the ordinary factors be thoroughly memorized.

*Third.* That processes should be made as simple and concise as possible.

*Fourth.* That immediate application be made of what has been taught in variety and in amount sufficient to fix the process.

*Fifth.* That continual review be provided in order that the pupil shall retain what he has learned.

It is this plan which has been carefully carried out in preparing the present series of books. Each written lesson is preceded by an oral lesson as a preparation for the work which is to follow; and each new problem is explained in a type lesson, which contains sufficient application to fix the type.

The arrangement of the material in four lessons followed by a review, with a week of review each fourth week, is made in order that the teacher shall follow up the work, week by week and month by month. In this way a teacher may discover the points which need further intensive drill.

It is not intended that the teacher shall feel bound to accomplish all the work laid out in each lesson in a recitation period. The part of the lesson which is not completed should be assigned for home work. If the lessons are used in the order of their arrangement, the new work will be found in the early part of the lesson, and when this is completed the remaining time should be given to such part of the review work of the lesson as needs special drill. If a class masters the type quickly, then part of the new work may be omitted and more time given to the review.

Since many teachers prefer to review particular types topically, an index in the back of the book shows in what lessons the particular topics are to be found. This index shows that the greater part of the time is given to the new work of the grade, but that there is a complete review of the work of all the preceding grades.

The amount of review work in the upper grades is so great that it is not possible to include a large number of problems of each kind in the review; but the important types of the preceding grades have been placed in the back of each book, where they may be used by the pupils who

have difficulty in the solution of problems belonging to the review types.

Drill sheets in all operations have been included. They will be found of value in fixing arithmetical facts and operations, and in securing speed and accuracy. These drills should be used daily, preceding the oral work.

In preparing the problems, care has been taken to avoid impractical and unbusinesslike situations, and to utilize the ordinary arithmetical language of business.

The series is the result of a careful study of classroom conditions by the authors, who have had many years of experience in the teaching of arithmetic; it is their hope and belief that herein teachers and pupils will find present arithmetical difficulties materially reduced.

The authors wish to express their sincere thanks to all their fellow-teachers who by counsel, by assisting in the selection or preparation of problems, and by their helpful and constructive criticisms, have aided so generously in the preparation of the work.

# ARITHMETIC BY PRACTICE

*FOURTH YEAR—SECOND HALF*

## TERM PLAN

| NEW | REVIEW |
|---|---|
| 1. Long Division by Three Orders. (Type I.) Notation to 1,000,000. | Division of Dollars and Cents. Notation. Numeration. Long Measure. |
| 2. Long Division by Three Orders. Roman Numerals, C to CC. | Addition. Notation. Long Measure. |
| 3. Multiplication with 0 in Tens' Place. (Type II.) Roman Numerals, CC. to CCC. | Notation. Addition. Division. |
| 4. Multiplication with 0 in Tens' Place. | Division. Addition. Problem with Two Operations. |

### REVIEW I

| | |
|---|---|
| 5. Addition and Subtraction of Fractions, the Denominators alike, and the Sum Less than a Unit. (Type III.) Teach Numerator, Denominator and Mixed Number. | Writing Fractions. Finding the Fractional Part of a Number. |

| NEW | REVIEW |
|---|---|
| 6. Addition and Subtraction of Fractions. | Addition. Notation. Finding the Fractional Part of a Number. Multiplication. Division. |
| 7. Addition of Fractions when the Sum of the Fractions Equals a Unit. (Type IV.) Subtraction of Fractions. | Finding the Fractional Part of a Number. Notation. Division. Multiplication. Addition. |
| 8. Addition and Subtraction of Fractions. | Finding the Fractional Part of a Number. Addition. Multiplication. Division. Problem with Two Operations. |

## Review II

| | |
|---|---|
| 9. Reduction of Fractions to Lower Terms. (Type V.) Teach Factor and Common Factor. | Division. Multiplication. Addition of Mixed Numbers. |
| 10. Reduction of Fractions to Lower Terms. Roman Numerals, CCC to CCCC. | Numeration. Notation. Addition. Subtraction. Subtraction of Fractions. |
| 11. Reduction of Fractions to Higher Terms. (Type VI.) | Addition of Mixed Numbers. Subtraction of Mixed Numbers. |
| 12. Reduction of Fractions to Higher Terms. | Multiplication of Dollars and Cents. Division of Dollars and Cents. Addition of Fractions. Subtraction of Mixed Numbers. |

## Review III

### Review A

| NEW | REVIEW |
|---|---|
| 13. Subtraction of Fractions. | Addition of Mixed Numbers. Long Measure. Finding Fractional Parts. Addition. Reduction of Fractions. Notation. |
| 14. Subtraction of Fractions. | Addition of Mixed Numbers. Division. Finding Fractional Parts. Reduction of Fractions. Addition. Avoirdupois Weight. |
| 15. Reduction of Improper Fractions to Whole or Mixed Numbers. (Type VII.) Teach Proper and Improper Fractions. Addition of Fractions whose Sum is More than One. (Type VIII.) | Subtraction of Fractions. Division. Finding Fractional Parts. |
| 16. Reduction of Fractions. Addition of Fractions. | Subtraction of Fractions. Division. Finding Fractional Parts. |

## Review IV

| | |
|---|---|
| 17. Multiples and Common Multiples. (Type IX.) | Addition of Fractions. Long and Liquid Measure. Dozen. Roman Numerals. Subtraction of Fractions. Division. Problem with Two Operations. |

| NEW | REVIEW |
|---|---|
| 18. Common Multiples of Denominators. | Reduction of Fractions. Addition and Subtraction of Fractions. Long Measure. Addition. |
| 19. Teach Roman Numerals, CD to D. Addition and Subtraction of Fractions with Different Denominators, and Numerators of One. (Type X.) Teach the Term, Net Weight. | Roman Numerals. Dozen. Problem with Two Operations. |
| 20. Addition of Unlike Fractions. | Division. Finding the Fractional Part of a Number. Notation. Subtraction. Liquid Measure. Avoirdupois Weight. Subtraction of Fractions. |

## Review V

| | |
|---|---|
| 21. Addition of Fractions with Different Denominators, and Numerators More than One. (Type XI.) | Bill and Change. Multiplication. Dry Measure. Division. Subtraction of Fractions. |
| 22. Addition and Subtraction of Fractions. | Time Measure. Notation. Addition. Problems with Two Operations. Division. Finding Fractional Parts. Multiples. |
| 23. Addition and Subtraction of Fractions. Two Operations. | Notation. Addition. Division. Dry Measure. Problems with Two Operations. |

| NEW | REVIEW |
|---|---|
| 24. Problems with Two Operations. | Time Measure. Notation. Addition. Two Operations in Division. Long Measure. Multiplication. Finding Fractional Parts. |

## Review VI

## Review B

| | |
|---|---|
| 25. Problems with Two Operations. | Division. Finding Fractional Parts. Addition. Liquid Measure. Avoirdupois Weight. |
| 26. Subtraction of a Mixed Number from a Whole Number. (Type XII.) | Problem with Two Operations. Addition. Multiplication. Reduction of Fractions. Terms in Subtraction and Division. Long Measure. |
| 27. Subtraction of a Mixed Number from a Whole Number. | Problem with Two Operations. Dry Measure. Finding Fractional Parts. Division. Addition of Mixed Numbers. |
| 28. Subtraction of Fractions. Roman Numerals, D to DCC. | Problems with Two Operations. Roman Numerals. Liquid Measure. Dozen. |

## Review VII

| | |
|---|---|
| 29. Reduction of Mixed Numbers to Improper Fractions. (Type XIII.) | Notation. Addition. Roman Numerals. Long Measure. Numeration. Subtraction of of Fractions. Bill. |

| NEW | REVIEW |
|---|---|
| 30. Reduction of Mixed Numbers to Improper Fractions. | Terms in Division. Finding Fractional Parts. Multiplication. Bill. |
| 31. Subtraction of Mixed Numbers, with the Fraction in the Minuend Smaller than in the Subtrahend. (Type XIV.) | Problem with Two Operations. Finding Fractional Parts. Addition. Notation. Division. Addition of Fractions. |
| 32. Subtraction of Fractions. | Notation. Addition. Division. Problem with Two Operations. Liquid Measure. Finding Fractional Parts. Addition of Fractions. |

## Review VIII

| | |
|---|---|
| 33. Subtraction of Fractions. Roman Numerals, DCC to DCCC. | Problems: Two Operations. Fractional Parts. Addition of Fractions. Terms in Subtraction. Division. |
| 34. Subtraction of Fractions. Problems with Fractions. | Addition of Fractions. Reduction of Fractions. Change. Two Operations. Long Measure. Dozen. |
| 35. Problems with Fractions. | Notation and Addition. Addition of Fractions. Fractional Parts. Two Operations. |
| 36. Reduction of Improper Fractions to Whole or Mixed Numbers. | Addition of Mixed Numbers. |

## Review IX

## Review C

| NEW | REVIEW |
|---|---|
| 37. Reduction of Fractions to Mixed Numbers. Roman Numerals, DCCC to CM. | Subtraction of Mixed Numbers. Addition. Two Operation Problem. Addition of Fractions. Reduction of Fractions. |
| 38. Problems with Fractions. | Notation and Addition. Division. Numeration. Two Operation Problem. Roman Numerals. |
| 39. Cancellation. (Type XV.) Roman Numerals, CM to M. | Fractional Parts. Addition of Mixed Numbers. |
| 40. Use of Horizontal Line to Express Division. | Dozen. Addition and Subtraction of Fractions. Two Operation Problem. |

## Review X

| | |
|---|---|
| 41. Cancellation. Cost of Many to Find the Cost of Many. (Type XVI.) | Multiplication. Roman Numerals. Dry Measure. Long Measure. Addition and Subtraction of Fractions. |
| 42. Cancellation. | Addition and Subtraction of Mixed Numbers. Two Operation Problem. |
| 43. Area of Rectangles. (Type XVII.) | Cancellation. Addition. Addition and Subtraction. Mixed Numbers. |
| 44. Area. | Roman Numerals. Cancellation. Fractional Parts. Addition of Fractions. Two Operation Problem. |

## Review XI

| NEW | REVIEW |
|---|---|
| 45. Area. Teach that 144 sq. in. = 1 sq. ft. Reduction of Square Inches to Square Feet. | Roman Numerals. Cancellation. Fractional Parts. Two Operation Problem. |
| 46. Area. Reduction of Square Feet to Square Inches. | Roman Numerals. Cancellation. Two Operation Problem. |
| 47. Area Problems. Teach that 9 sq. ft. = 1 sq. yd. Reduction of Square Feet to Square Yards. | Two Operation Problems. Cancellation. |
| 48. Area Problems. Reductions in Square Measure. | Two Operation Problems. Addition. |

## Review XII

## Review D

| | |
|---|---|
| 49. Multiplication by a Unit and a Fraction with Unit Numerator. (Type XVIII.) | Area. Dozen. Cancellation. Square Measure. Subtraction. |
| 50. Multiplication by a Unit and Unit Fraction. | Area. Square Measure. Numeration. Two Operation Problem. Cancellation. |
| 51. Short Process of Multiplying by 10 or Multiple of 10. | Two Operation Problems. Area. Multiplication. Notation. Subtraction. Dozen. Fractional Parts. |
| 52. Short Process of Multiplication. | Area. Multiplication. Notation. Addition. Fractional Parts. Square Measure. |

## Review XIII

| NEW | REVIEW |
|---|---|
| 53. Short Process of Division by 10 or Multiple of 10. | Two Operation Problem. Area. Division. Notat on. Subtraction. Fractional Parts. |
| 54. Short Process of Division. | Fractional Parts. Area. Two Operation Problem. Notation. Addition. Square Measure. |
| 55. Dry Measure. | Multiplication by a Unit and Fraction. Area. Square Measure. Two Operation Problem. |
| 56. Dry Measure. | Multiplication by Unit and Fraction. Area. Square Measure. Addition of Fractions. Addition. Two Operation Problem. |

REVIEW XIV

| | |
|---|---|
| 57. Liquid Measure. Teach that 4 gi. = 1 pt. | Dry Measure. Addition of Fractions. Roman Numerals. Division. |
| 58. Liquid Measure. | Two Operation Problem. Addition of Fractions. |
| 59. Long Measure. | Addition and Subtraction of Fractions. Dry Measure. Liquid Measure. Area. Two Operation Problem. |
| 60. Long Measure. | Multiplication by a Unit and Fraction. Dry Measure. Liquid Measure. Two Operation Problem. Area. Subtraction of Fractions. |

REVIEW XV

REVIEW E

## TYPE I

### LONG DIVISION BY NUMBERS OF THREE FIGURES

1. Divide 82,208 by 112.

$$
\begin{array}{r}
734 \\
112\overline{)82{,}208} \\
784 \\
\hline
380 \\
336 \\
\hline
448 \\
448 \\
\hline
\end{array}
$$

2. Divide 71,000 by 125.

$$
\begin{array}{r}
568 \\
125\overline{)71{,}000} \\
625 \\
\hline
850 \\
750 \\
\hline
1000 \\
1000 \\
\hline
\end{array}
$$

3. Divide 61,614 by 189.
4. 83,592 ÷ 258 = ?
5. 167,352 ÷ 367 = ?
6. 130,298 ÷ 574 = ?
7. 356,907 ÷ 439 = ?
8. 117,390 ÷ 602 = ?
9. 358,978 ÷ 751 = ?
10. 438,249 ÷ 861 = ?
11. 573,344 ÷ 943 = ?

## LESSON 1

### ORAL

1. $45+36=?$
2. From 52 take 18.
3. What will 13 two-cent stamps cost?
4. Separate 39 into two factors.
5. How many rods are there in one mile?

### WRITTEN

1. Divide 3210 by 214.
2. $78{,}240 \div 326 = ?$
3. I bought 464 books for \$167.04. What was the cost of each?
4. A buyer ordered 144 chairs. They were billed at \$678.24. What was the price of each?
5. How many times is 693 contained in 108,108?
6. Write in words 873,624.
7. Write in words 359,507.
8. Write one hundred sixteen thousand three hundred eighty-five.
9. Write in figures two hundred one thousand six hundred.
10. How many miles are there in 5760 rd.?

## LESSON 2

*Teach the Roman numbers C to CC.*

### ORAL

1. What Arabic number is represented by CIV?
2. How many feet long is a ribbon 60 in. long?
3. $18+57=?$
4. $26\times2=?$
5. What number multiplied by 2 will give a product of 28?

### WRITTEN

1. $38{,}324\div268=?$
2. $76{,}648\div143=?$
3. Doll & Co. spent $57,600 in making 256 pianos. What did each cost?
4. How many feet are there in 372 in.?
5. What will my rent for 18 months amount to at $37.50 a month?
6. Add
$$\begin{array}{r} 392{,}784 \\ 409{,}386 \\ 4{,}007 \\ 82{,}986 \\ 4{,}499 \\ \hline \end{array}$$

7. Write three hundred three thousand nine; twenty thousand four; one hundred sixteen thousand three.
8. Write in Roman numerals 109, 150, 149, 184, 163.
9. Add forty-six thousand three hundred ten; four hundred eight thousand seven; two thousand eight.
10. Add
$$\begin{array}{r} \$\ 364.96 \\ 6292.92 \\ 497.87 \\ 98.93 \\ 1449.85 \\ \hline \end{array}$$

## TYPE II

### MULTIPLICATION BY 3 ORDERS WITH 0 IN TENS' PLACE

1. 384
×207
2688
768
79,488

(*a*) Multiply by the first figure of the multiplier, 7.

(*b*) Since the product of a number and 0 is 0, we omit the multiplication by 0 and proceed to the next figure of the multiplier, 2. Write the first figure of the product under the figure 2 of the multiplier.

2. Multiply 517 by 305.
3. $1172 \times 509 = ?$
4. $682 \times 704 = ?$
5. $229 \times 105 = ?$
6. $354 \times 203 = ?$
7. $192 \times 607 = ?$
8. $2175 \times 702 = ?$
9. $1324 \times 309 = ?$
10. $976 \times 104 = ?$

## LESSON 3

*Teach the Roman numbers CC to CCC.*

### ORAL

1. CC+C=?
2. How many 15's in 45?
3. Add \$.58 and \$.36.
4. A boy had \$.75. He spent \$.48. What had he left?
5. $14 \times 2 = ?$

### WRITTEN

1. Find the cost of 306 autos @ \$496 each.
2. $594 \times 507 = ?$
3. Mr. Smith bought 396 yd. of white goods for decorations. At \$2.09 per yard, what did the decorations cost?
4. Multiply 114 by 809.
5. What is the product if the multiplicand is 205 and the multiplier is 204?
6. Add twenty seven thousand nine hundred; five hundred ten thousand four hundred eight; forty-nine; three thousand seven; four hundred four thousand eight; twenty-nine thousand.
7. Add nineteen dollars four cents; thirty-two dollars six cents; fourteen cents; sixty-nine dollars eight cents.
8. Write in words 3C4; 946,006; 409,302.
9. Write in Roman numerals 200, 259, 239, 219, 274.
10. Divide 379,603 by 427.

## LESSON 4

### ORAL

1. What will 27 buttons cost at 2¢ each?
2. Find $\frac{1}{2}$ of 42.
3. If 3 pens cost $6, what will a dozen pens cost?
4. $27+19=?$
5. If you buy 8 apples at 2¢ each, what change do you receive from a quarter dollar?

### WRITTEN

1. A dealer bought 184 qt. of oil @ $2.09 a quart. What was the cost?
2. Multiply $4.27 by 306.
3. $892\times507=?$
4. A buyer ordered 609 dozen pearl buttons @ $2.87 per dozen. What was the cost?
5. What will 18 bu. of potatoes cost at $1.20 a bushel?
6. $\$1312.48\div208=?$
7. $46{,}350+27{,}856+30{,}892+35{,}759+8628=?$
8. When cloth is bought at $1.08 a yard and sold at $1.50 a yard, what is the gain in selling 65 yd.?
9. If a farmer receives $64.50 for 30 bbl. of potatoes, what should he receive for 18 bbl. at the same price?
10. If it costs $60 to buy the books for a class of 30 pupils, what will be the cost for a class of 38 pupils?

## REVIEW I

1. If it costs \$2.67 to ride 89 miles on a railroad, what will it cost for 76 miles?

2. Divide 119,232 by 368.

3. $81{,}469 \div 257 = ?$

4. Multiply 279 by 306.

5. Write in words; 460,070.

6. There were 469 cars in 7 freight trains. How many cars in 9 trains of the same length?

7. Add forty-six thousand seven hundred; nine thousand eight hundred seventy; six hundred seventy-nine; five thousand twenty; two thousand nine.

8. What is $\frac{5}{8}$ of \$144?

9. There are 480 sheets of paper in a ream. Find the number of sheets in 204 reams.

10. Add CIX, CXLVI, CCLIV, CCIX, CCLXXI.

## ADDITION DRILL

| *A* | *B* | *C* | *D* | *E* | *F* | *G* |
|---|---|---|---|---|---|---|
| 67 | 87 | 78 | 47 | 79 | 96 | 56 |
| 59 | 29 | 39 | 92 | 84 | 68 | 34 |
| 46 | 16 | 47 | 38 | 26 | 21 | 27 |
| 13 | 89 | 82 | 71 | 46 | 93 | 87 |
| 87 | 68 | 95 | 46 | 53 | 17 | 59 |
| 54 | 27 | 17 | 89 | 69 | 42 | 53 |
| 37 | 94 | 43 | 21 | 30 | 56 | 64 |
| 87 | 86 | 77 | 97 | 28 | 38 | 72 |
| 24 | 56 | 98 | 13 | 96 | 19 | 45 |
| 96 | 97 | 87 | 42 | 19 | 45 | 96 |
| 78 | 83 | 29 | 97 | 24 | 14 | 76 |
| 21 | 17 | 49 | 13 | 79 | 68 | 94 |
| 93 | 78 | 31 | 48 | 38 | 98 | 87 |
| 17 | 35 | 53 | 79 | 68 | 92 | 13 |
| 42 | 86 | 36 | 24 | 37 | 78 | 88 |
| 56 | 14 | 67 | 96 | 24 | 47 | 87 |
| 38 | 23 | 95 | 36 | 66 | 13 | 37 |
| 19 | 57 | 25 | 79 | 92 | 26 | 79 |
| 79 | 39 | 87 | 51 | 93 | 96 | 21 |
| 38 | 56 | 23 | 46 | 38 | 25 | 70 |

## ADDITION DRILL—*Continued*

| *A* | *B* | *C* | *D* | *E* | *F* | *G* |
|---|---|---|---|---|---|---|
| 57 | 65 | 86 | 98 | 54 | 32 | 64 |
| 26 | 45 | 24 | 12 | 56 | 78 | 46 |
| 58 | 98 | 76 | 85 | 96 | 54 | 27 |
| 92 | 75 | 58 | 76 | 69 | 79 | 79 |
| 46 | 47 | 86 | 59 | 55 | 87 | 94 |
| 94 | 12 | 34 | 87 | 65 | 43 | 43 |
| 18 | 98 | 76 | 23 | 45 | 67 | 67 |
| 87 | 76 | 43 | 32 | 45 | 35 | 32 |
| 23 | 23 | 56 | 67 | 54 | 64 | 67 |
| 15 | 12 | 24 | 34 | 25 | 13 | 32 |
| 15 | 87 | 75 | 65 | 74 | 86 | 67 |
| 54 | 56 | 98 | 98 | 76 | 64 | 53 |
| — | — | — | — | — | — | — |
| 56 | 76 | 87 | 92 | 83 | 84 | 76 |
| 34 | 34 | 23 | 18 | 27 | 26 | 34 |
| 27 | 12 | 31 | 42 | 35 | 52 | 13 |
| 87 | 34 | 62 | 53 | 42 | 53 | 53 |
| 59 | 24 | 55 | 32 | 14 | 14 | 63 |
| 53 | 83 | 95 | 43 | 56 | 65 | 53 |
| 64 | 56 | 54 | 56 | 85 | 53 | 45 |
| 72 | 98 | 79 | 97 | 79 | 59 | 95 |
| 45 | 79 | 98 | 98 | 97 | 96 | 49 |
| 68 | 42 | 53 | 64 | 29 | 26 | 62 |
| 98 | 18 | 10 | 70 | 86 | 54 | 30 |
| — | — | — | — | — | — | — |

## MULTIPLICATION DRILL

| *A* | *B* | *C* |
|---|---|---|
| 103,069 | 48,527 | 310,079 |
| ×15 | ×19 | ×22 |
| 82,304 | 120,903 | 37,005 |
| ×13 | ×14 | ×21 |
| 42,067 | 90,531 | 390,642 |
| ×25 | ×23 | ×16 |
| 138,462 | 53,071 | 112,253 |
| ×18 | ×24 | ×17 |
| 301,122 | 42,903 | 65,308 |
| ×21 | ×18 | ×14 |
| 47,092 | 36,521 | 465,003 |
| ×15 | ×23 | ×19 |
| 82,105 | 19,362 | 40,731 |
| ×24 | ×16 | ×13 |
| 60,539 | 74,207 | |
| ×22 | ×17 | |

# TYPE III

## ADDITION OF FRACTIONS HAVING THE SAME DENOMINATOR

*Teach that in a fraction:*

*A. The number above the line is called the* **numerator.**

*B. The number below the line is called the* **denominator.**

1. $\frac{1}{9}$ (*a*) 1 apple + 5 apples + 2 apples = 8 apples.
   $\frac{5}{9}$ (*b*) 1 ninth + 5 ninths + 2 ninths = 8 ninths.
   $\frac{2}{9}$
   $\frac{8}{9}$

RULE: *Add the numerators and write the sum over the denominator.*

2. Add $\frac{1}{8}$ $\frac{3}{8}$ $\frac{2}{8}$

3. Add $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

4. Add $\frac{3}{11}$ $\frac{4}{11}$ $\frac{1}{11}$ $\frac{2}{11}$

5. Add $\frac{5}{17}$ $\frac{3}{17}$ $\frac{6}{17}$

## ADDITION OF MIXED NUMBERS

A whole number and a fraction written together is called a *mixed number.*

1. Add $3\frac{2}{7}$ (*a*) Add the numerators and write the
   $1\frac{1}{7}$ sum over the denominator.
   $5\frac{3}{7}$ (*b*) Add the whole numbers.
   — (*c*) Add the two answers.
   $9\frac{6}{7}$ *Ans.*

2. Add $4\frac{3}{19}$ $5\frac{7}{19}$ $6\frac{5}{19}$

3. Add $14\frac{2}{11}$ $2\frac{5}{11}$ $6\frac{1}{11}$

4. $110\frac{11}{27} + 58\frac{4}{27} + 90\frac{7}{27} = ?$

5. What is the sum of $7\frac{8}{15}$, $2\frac{4}{15}$, and 15.

## TYPE III—*Continued*

### SUBTRACTION OF FRACTIONS HAVING THE SAME DENOMINATOR

1. From $\frac{3}{4}$ take $\frac{1}{4}$.

$\frac{3}{4}$
$-\frac{1}{4}$
$\frac{2}{4}$

(*a*) 1 apple from 3 apples leaves 2 apples.

(*b*) 1 fourth from 3 fourths leaves 2 fourths.

RULE: *Subtract the numerators and write the difference over the denominator.*

2. From $\frac{8}{9}$ take $\frac{3}{9}$.
3. From $\frac{6}{7}$ take $\frac{3}{7}$.
4. From $\frac{7}{13}$ take $\frac{3}{13}$.
5. From $\frac{8}{15}$ take $\frac{2}{15}$.

### SUBTRACTION OF MIXED NUMBERS

1. From $12\frac{5}{8}$ take $9\frac{3}{8}$.

$12\frac{5}{8}$
$-9\frac{3}{8}$
$3\frac{2}{8}$

(*a*) Subtract the fractions.

(*b*) Subtract the whole numbers.

(*c*) Add the whole number and fraction together.

2. From $8\frac{5}{7}$ take $3\frac{2}{7}$.
3. $9\frac{7}{9}$ minus $8\frac{5}{9} = ?$
4. A boy had $\$8\frac{3}{4}$ and spent $\$5\frac{1}{4}$. How much had he left?
5. What is the difference between $16\frac{7}{12}$ and $11\frac{5}{12}$?
6. $124\frac{11}{18} - 99\frac{7}{18} = ?$

## LESSON 5

### ORAL

1. $3\frac{1}{4}+2\frac{1}{4}=?$

2. What fraction has a numerator of 2 and a denominator of 5?

3. What is $\frac{2}{3}$ of 21?

4. $13\times3=?$

5. How many 28's are there in 56?

### WRITTEN

1. $9\frac{3}{7}+18\frac{1}{7}+29\frac{2}{7}=?$

2. (*a*) $\frac{18}{25}-\frac{11}{25}=?$ (*b*) $\frac{9}{16}-\frac{5}{16}=?$

3. From $24\frac{2}{3}$ take $19\frac{1}{3}$.

4. I spent $\$36\frac{1}{4}$ in one day, $\$49\frac{1}{4}$ the second day, and $\$48\frac{1}{4}$ the third day. How much did I spend in all?

5. Mr. Ward drove his auto $37\frac{3}{8}$ mi. on Monday, $49\frac{1}{8}$ mi. on Tuesday, and $27\frac{3}{8}$ mi. on Wednesday. How many miles did he go in the three days?

6. (*a*) In the fractions $\frac{1}{2}$ and $\frac{3}{4}$, which figures are the numerators and which are the denominators?

(*b*) Write the fraction whose numerator is 5 and whose denominator is 8.

7. Find $\frac{3}{4}$ of 576.

8. In an orchard of 665 trees, $\frac{3}{5}$ are peach trees; the rest are apple trees. Find the number of apple trees.

9. Mrs. W. had \$4509. She spent $\frac{5}{8}$ of it. How much had she left?

10. Of 2214 passengers on a ship, $\frac{5}{6}$ were born in Europe and the rest were Americans. How many Americans were there on the ship?

## LESSON 6

### ORAL

1. Find the sum of $4\frac{1}{3}$ and $3\frac{1}{3}$.
2. $45+36=?$
3. $15\times2=?$
4. How many 16's are there in 32?
5. A girl who had 50¢ spent $\frac{1}{2}$ of it. How much money had she left?

### WRITTEN

1. A tailor bought $32\frac{1}{8}$ yd. of goods at one time, then $29\frac{3}{8}$ yd., and then $34\frac{1}{8}$ yd. How many yards did he buy in all?
2. From $49\frac{13}{24}$ take $38\frac{5}{24}$.
3. A farmer has $4\frac{1}{16}$ bu. in one bin, $8\frac{3}{16}$ bu. in another, and $11\frac{5}{16}$ bu. in a third. How many bushels are there in the 3 bins?
4. Mrs. Gray spent $\$14\frac{1}{10}$ for groceries, $\$19\frac{3}{10}$ for dry goods, and $\$75\frac{1}{10}$ for house furnishings. How much did she spend in all?
5. $39\frac{9}{20}-27\frac{5}{20}=?$
6. Add 469,874; 391,009; 4627; 82,567; 4009; 36,987.
7. $279{,}531\div493=?$
8. A man having \$2564 spent $\frac{3}{4}$ of it. How much had he left?
9. Add 327 thousand; 4 thousand twenty-nine; two hundred forty thousand six hundred eight; 27 thousand; three hundred thousand six; four hundred two.
10. Multiply 358 by 504.

## TYPE IV

### ADDITION OF FRACTIONS WHERE THE SUM OF THE FRACTIONS AMOUNTS TO A UNIT

1. Add $2\frac{1}{2}$, $3\frac{1}{2}$ and 5.

| | |
|---|---|
| 2 | $\frac{1}{2}$ |
| 3 | $\frac{1}{2}$ |
| 5 | |
| 10 | $\frac{2}{2}=1$ |
| +1 | |
| 11 | *Ans.* |

$\frac{1}{2}+\frac{1}{2}=\frac{2}{2}=1$.

Add 1, the sum of the fractions, to 10, the sum of the integers: $10+1=11$.

2. $4\frac{2}{3}+3\frac{1}{3}=?$
3. Find the sum of $8\frac{1}{7}$, $2\frac{3}{7}$, and $4\frac{3}{7}$.
4. What is the sum of $7\frac{2}{5}$, $3\frac{5}{5}$, and $\frac{2}{5}$?
5. A father divided a sum of money among his three children. He gave $\$5\frac{2}{5}$ to one, $\$7\frac{2}{5}$ to another, and $\$8\frac{1}{5}$ to the third. How much money did they all receive?
6. $3\frac{5}{8}+4\frac{2}{8}+7\frac{1}{8}=?$
7. Find the sum of $6\frac{3}{10}$, $7\frac{1}{10}$, $4\frac{1}{10}$, and $5\frac{5}{10}$.
8. $6\frac{5}{12}+7\frac{1}{12}+3\frac{1}{12}+8\frac{5}{12}=?$
9. $3\frac{7}{24}+8\frac{1}{24}+2\frac{11}{24}+4\frac{5}{24}=?$
10. To the sum of $5\frac{7}{15}$, $6\frac{1}{15}$, $1\frac{2}{15}$ and $\frac{4}{15}$, add $3\frac{1}{15}$.

## LESSON 7

### ORAL

1. What is the sum of $\$2\frac{1}{2}$ and $\$3\frac{1}{2}$?
2. $4\frac{1}{4}+5\frac{3}{4}=?$
3. What will 3 yd. of cloth cost at $\$.14$ a yard?
4. How many 33's are there in 66?
5. How many inches are there in $\frac{5}{6}$ of a foot?

### WRITTEN

1. I spent at different times $\$14\frac{3}{4}$, $\$19\frac{1}{4}$, and $\$16$. How much have I spent in all?

2. I bought 3 pieces of goods containing $16\frac{2}{3}$ yd., $17\frac{1}{3}$ yd., and 14 yd. How many yards did I buy in all?

3. Add $13\frac{1}{8}$, $18\frac{3}{8}$, $17\frac{1}{8}$, and $2\frac{3}{8}$.

4. I had $\$650$ in the bank and drew out $\frac{5}{13}$ of it. How much was left in the bank?

5. Add three hundred thousand six; four hundred thousand twenty-four; ninety-eight thousand four hundred seven; one hundred thousand thirty; twenty-eight thousand eight; seventy-six.

6. $332{,}248 \div 698 = ?$

7. One dress costs $\$4.98$. Find the cost of 308 dresses.

8. $\frac{5}{7}$ of the passengers on a ship were steerage passengers. If the ship carried 1484 passengers, how many were in the steerage?

9. 165,600 people rode on a certain railway in 18 days. What was the average number carried daily?

10. John's answer to an example was $12\frac{9}{11}$. The correct answer was $9\frac{7}{11}$. How much too large was John's answer?

## LESSON 8

### ORAL

1. Add $1\frac{3}{4}$ and $6\frac{1}{4}$.
2. How many inches are there in $\frac{5}{12}$ of a yard?
3. $13 \times ? = 26$.
4. $14 \times 3 = ?$
5. $37 + 38 = ?$

### WRITTEN

1. Add $14\frac{2}{8}$, $16\frac{3}{8}$, $18\frac{4}{8}$.

2. I bought 3 pieces of goods containing $14\frac{2}{8}$ yd., $13\frac{3}{8}$ yd., and $6\frac{3}{8}$ yd. How many yards did I buy?

3. I spent at different times $\$16\frac{4}{10}$, $\$14\frac{3}{10}$, and $17\frac{3}{10}$. How much did I spend?

4. A farmer, having raised 492 bu. of corn, sold $\frac{5}{12}$ of it. How many bushels did he sell?

5. Add
306,492
29
8,008
6,600
34,404
396,268
34,486
108,060

6. The cost of 34 trolley cars was $176,800. How much is one car worth?

7. $864 \times 504 = ?$

8. A merchant's receipts for a year were $16,450. His expenses were $\frac{5}{7}$ of his receipts. How much were his expenses?

9. $27\frac{6}{10} + 18\frac{3}{10} - 16\frac{4}{10} = ?$

10. Divide $3436.20 by 498 and multiply the quotient by 608.

## REVIEW II

1. Add $6\frac{3}{8}$, $19\frac{5}{8}$, and 28.

2. $87\frac{8}{10} - 29\frac{7}{10} = ?$

3. $16\frac{9}{20} + 67\frac{3}{20} + 95\frac{1}{20} + 87\frac{7}{20} = ?$

4. A barrel of flour weighs 196 lb. What is the weight of 608 bbl.?

5. How many freight cars, each 33 ft. long, can be placed on a mile of track?

6. Divide 314,184 by 689.

7. 81 horses were sold at $155 apiece and the money invested in mules at $279 each. How many mules were bought?

8. In target practice a battleship fired 144 shots. $\frac{11}{12}$ of these hit the target. How many shells missed the target?

9. If $\frac{5}{8}$ of a magazine of 312 pages consists of advertisements, how many pages are left for reading matter?

10. Add
68,975
7,894
179,548
959
23,487
516,376

## MULTIPLICATION DRILL

| | | |
|---|---|---|
| 31,206 | 14,009 | 32,758 |
| ×26 | ×41 | ×35 |
| 41,906 | 83,827 | 91,604 |
| ×48 | ×27 | ×32 |
| 836,221 | 45,703 | 36,594 |
| ×36 | ×42 | ×28 |
| 79,036 | 21,384 | 41,957 |
| ×29 | ×31 | ×43 |
| 83,751 | 20,688 | 91,703 |
| ×44 | ×37 | ×34 |
| 82,461 | 42,583 | 37,095 |
| ×38 | ×45 | ×39 |
| 70,992 | 63,551 | 40,879 |
| ×47 | ×87 | ×46 |
| 38,752 | 60,427 | 15,037 |
| ×49 | ×58 | ×52 |
| 49,208 | 61,472 | 20,885 |
| ×67 | ×78 | ×94 |

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with successive trials. Note improvement in* **speed** *and* **accuracy.**

| *A* | *B* | *C* | *D* |
|---|---|---|---|
| $?\times 26=52$ | $\frac{1}{2}$ of $64=?$ | $2)\underline{76}$ | $2)\underline{?}$ |
| $?)\underline{58}$ | $38\times 2=?$ | $?$ | $28$ |
| $2$ | $37)\underline{?}$ | $54\div ?=2$ | $72\div ?=36$ |
| $74\div 37=?$ | $2$ | $\frac{1}{2}$ of $?=33$ | $?\times 2=62$ |
| $\frac{1}{2}$ of $72=?$ | $52\div 26=?$ | $31)\underline{62}$ | $\frac{1}{28}$ of $56=?$ |
| $39)\underline{?}$ | $\frac{1}{40}$ of $80=?$ | $?$ | $?\div 30=2$ |
| $2$ | $?\div 34=2$ | $40)\underline{?}$ | $?\times 16=48$ |
| $64\div 2=?$ | $2)\underline{?}$ | $2$ | $45\div 15=?$ |
| $?\div 2=39$ | $35$ | $?\div 2=29$ | $2)\underline{?}$ |
| $66\div ?=2$ | $\frac{1}{2}$ of $54=?$ | $2)\underline{60}$ | $25$ |
| $2\times ?=68$ | $3)\underline{?}$ | $?$ | $?\div 24=2$ |
| $?\times 21=42$ | $15$ | $\frac{1}{14}$ of $?=3$ | $\frac{1}{20}$ of $?=2$ |
| $\frac{1}{3}$ of $?=16$ | $44\div ?=22$ | $?)\underline{46}$ | |
| $2\times ?=40$ | $13)\underline{39}$ | $2$ | |
| $?\times 3=39$ | $?$ | $\frac{1}{2}$ of $50=?$ | |
| $?)\underline{48}$ | $?\div 2=25$ | $42\div 2=?$ | |
| $3$ | $3)\underline{?}$ | $?\div 3=14$ | |
| $?\times 25=50$ | $14$ | $\frac{1}{2}$ of $?=22$ | |
| | $?)\underline{46}$ | | |
| | $2$ | | |

## TYPE V

### REDUCTION OF FRACTIONS TO LOWER TERMS

*Teach that*

*A. The factors of a number are the* **integers** *whose product equals the number.*

*B. Any number which is a* **factor** *of two or more numbers is called a* **common factor** *of those numbers.*

1. Reduce $\frac{24}{36}$ to lower terms.
   (*a*) Find a common factor of 24 and 36.
   (*b*) 12 is a common factor of 24 and 36.
   (*c*) Divide both numerator and denominator by 12.

$$\frac{24 \div 12 = 2}{36 \div 12 = 3}. \quad Ans$$

RULE: *To reduce a fraction to lower terms, divide both numerator and denominator by a common factor.*

2. Reduce $\frac{8}{12}$ to lower terms.
3. Reduce $\frac{9}{12}$ to lower terms.
4. Reduce $\frac{16}{18}$ to lower terms.
5. Find a fraction which is equal to $\frac{8}{24}$.
6. Reduce $\frac{27}{45}$ to lower terms.
7. Reduce $\frac{48}{60}$ to lower terms.

## LESSON 9

### ORAL

1. Reduce $\frac{4}{8}$ to lower terms.
2. $3\frac{3}{4}+4\frac{1}{4}=?$
3. $28\times2=?$
4. $?\times39=78$.
5. If 4 qt. of milk cost 36¢, what will 5 qt. cost?

### WRITTEN

1. Reduce $\frac{6}{16}$ to lower terms.
2. Change $\frac{18}{24}$ to lower terms.
3. Reduce $\frac{16}{24}$ to lower terms.
4. Reduce $\frac{36}{48}$ to lower terms.
5. $\frac{216}{128}=?$
6. What will 206 bbl. of flour cost at $4.75 a barrel?
7. Divide 878,811 by 290.
8. A man receives $97.50 for 26 days' work. What is he paid per day?
9. Add $13\frac{5}{12}$, $8\frac{3}{12}$, $7\frac{1}{12}$ and $4\frac{2}{12}$.
10. Find the sum of $3\frac{2}{11}$, $1\frac{5}{11}$, and $8\frac{4}{11}$.

## LESSON 10

*Teach Roman numbers CCC to CCCC.*

### ORAL

1. Reduce $\frac{12}{16}$ to lower terms.
2. $3 \times 16 = ?$
3. How many 35's in 70?
4. $2\frac{1}{2} + 6\frac{1}{2} = ?$
5. What Arabic number is equivalent to CCLX?

### WRITTEN

1. Reduce $\frac{32}{36}$ to lower terms.
2. $\frac{36}{120}$ = what fraction in lower terms?
3. Change $\frac{24}{64}$ to lower terms.
4. A merchant bought $54\frac{8}{9}$ bu. of corn and sold $38\frac{2}{9}$ bu. How many bushels remained?
5. Reduce the fraction having 36 for its numerator and 126 for its denominator to lower terms.
6. Write in words 400,004; 172; 468,019; 400,023.
7. Write in figures and add two hundred seven thousand seven hundred; fourteen thousand four; three hundred eighty-nine; four hundred fifty-one thousand three hundred nine; sixty-five; ten thousand six; two thousand seven hundred sixty.
8. Write the Roman numerals for 398, 356, 323, 46, 19, 147.
9. From four hundred seven thousand twenty, take three hundred twenty-eight thousand eight hundred forty-six.
10. Add 326,871; 248,907; 10,420; 216,498; 114,460; 97; 4,286.

## TYPE VI

### REDUCTION OF FRACTIONS TO HIGHER TERMS

*A.* $1=\frac{2}{2}, \frac{3}{3}, \frac{4}{4}, \frac{5}{5}, \frac{8}{8}, \frac{12}{12}$, etc.

1. $\frac{1}{2}$ is how many fourths?

Since $1=\frac{4}{4}$, $\frac{1}{2}=\frac{1}{2}$ of 4 fourths $=\frac{2}{4}$.

Changing $\frac{1}{2}$ to $\frac{2}{4}$ is equivalent to multiplying both numerator and denominator by 2.

$$\frac{1}{2}\times\frac{2}{2}=\frac{2}{4}.$$

2. Change $\frac{1}{2}$ to 6ths, to 8ths, to 10ths, to 12ths.
3. Change $\frac{1}{3}$ to 6ths, to 9ths, to 12ths, to 15ths.
4. Change $\frac{1}{4}$ to 8ths, to 12ths, to 16ths, to 24ths.

PRINCIPLE: *Multiplying both numerator and denominator of a fraction by the same number does not change the value of the fraction.*

5. Change $\frac{2}{3}$ to 6ths.

   $\frac{1}{3}=\frac{1}{3}$ of 6 sixths $=\frac{2}{6}$. $\frac{2}{3}=2$ times $\frac{1}{3}=2$ times 2 sixths $=\frac{4}{6}$.

6. Change $\frac{3}{4}$ to 12ths.

   $\frac{1}{4}=(\frac{1}{4}$ of $\frac{12}{12})=\frac{3}{12}$. $\frac{3}{4}=(3$ times $\frac{1}{4})=3$ times $\frac{3}{12}=\frac{9}{12}$.

7. $\frac{3}{5}=\frac{?}{10}$; $\frac{4}{5}=\frac{?}{10}$; $\frac{5}{6}=\frac{?}{12}$; $\frac{5}{8}=\frac{?}{16}$.
8. How did you find the number of tenths in $\frac{1}{5}$?
9. How did you find the number of 10ths in $\frac{3}{5}$? in $\frac{4}{5}$?

RULE: *Divide the denominator required by the denominator of the fraction, and multiply both terms of the fraction by the quotient.*

10. Change $\frac{3}{8}$ to 16ths, to 24ths.
11. Change $\frac{2}{3}$ to 9ths, to 15ths, to 18ths.

## LESSON 11

### ORAL

1. $\frac{4}{5} = \frac{?}{10}$?
2. $3 \times 14 = ?$
3. Find the sum of $4\frac{1}{3}$ and $4\frac{2}{3}$.
4. $\frac{6}{8} = \frac{3}{?}$?
5. How many 14's in 28?

### WRITTEN

1. Change $\frac{4}{5}$ to 40ths.
2. Change $\frac{3}{8}$ to 24ths.
3. Change $\frac{5}{6}$ to 48ths.
4. $\frac{7}{9}$ to 18ths.
5. The numerator of a certain fraction is 5; the denominator is 17. Change the fraction to one having 34 for its denominator.
6. I spent at different times $\$4\frac{3}{10}$, $\$16\frac{1}{10}$, and $\$\frac{3}{10}$. How much did I spend?
7. A miller bought $78\frac{2}{5}$ bu. of wheat from Mr. A. and $86\frac{1}{5}$ bu. from Mr. B. How many bushels did he buy from both?
8. Add $14\frac{5}{31}$, $21\frac{7}{31}$, $68\frac{9}{31}$, and $98\frac{4}{31}$.
9. Mr. Smith bought 3 parcels of land containing $4\frac{3}{16}$ acres, $126\frac{5}{16}$ acres, and $47\frac{7}{16}$ acres. How many acres did he buy in all?
10. $5\frac{5}{12} + 7\frac{5}{12} + 9\frac{1}{12} - 14\frac{1}{12} = ?$

## LESSON 12

### ORAL

1. $\frac{2}{3} = \frac{?}{12}$?
2. $2\frac{2}{3} + 5\frac{1}{3} = ?$
3. $2 \times 34 = ?$
4. $37 \times ? = 74$.
5. If you can buy 6 lemons for a nickel, how many can you buy for a dime?

### WRITTEN

1. The numerator of a fraction is 4, and the denominator is 9. Change the fraction to one with a denominator of 36.
2. Change $\frac{11}{12}$ to 60ths.
3. Change $\frac{4}{5}$ to 30ths.
4. Change $\frac{8}{11}$ to 44ths.
5. Find the difference between $37\frac{2}{43}$ and $29\frac{13}{43}$.
6. Add $\frac{17}{42}$, $\frac{11}{42}$, $\frac{5}{42}$, and $\frac{1}{42}$.
7. What is the sum of $\frac{11}{36}$, $\frac{13}{36}$, and $\frac{7}{36}$?
8. At \$15.75 an acre, what is the value of a farm containing 437 acres?
9. Cattle cost \$48.37 per head. Find the cost of 58 head.
10. A shipment of hay weighing 230 tons was sold for \$3392.50. What was the selling price per ton?

## REVIEW III

1. Reduce $\frac{36}{64}$ to lower terms.
2. Change to 72nds: $\frac{3}{8}$, $\frac{2}{3}$, $\frac{5}{6}$, $\frac{11}{12}$.
3. Divide 200,880 by 432.
4. Add $65\frac{1}{32}$, $47\frac{5}{32}$, and $53\frac{3}{32}$.
5. Multiply 342 by 689.
6. A blast furnace produces 435 tons of pig iron in 15 days. What was the average number of tons produced daily?
7. A merchant bought 96 yd. of material, but sold only $\frac{13}{16}$ of it. How much was what he had left worth at \$.08 per yard?
8. Add two hundred eighty thousand nine hundred; seventy-nine thousand eighty-nine; three hundred eight thousand seven hundred six; one hundred ninety thousand seven; twenty thousand six hundred fifteen.
9. Write in Roman numerals 394, 349, 265.
10. Subtract four thousand seven hundred fifty-eight from eight thousand thirty-two.

## MULTIPLICATION DRILL

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| 1234 | 2312 | 1231 | 2312 | 1322 | 2132 |
| ×212 | ×213 | ×321 | ×132 | ×233 | ×232 |
| 3231 | 3223 | 2212 | 3423 | 2212 | 2012 |
| ×213 | ×121 | ×124 | ×211 | ×214 | ×343 |
| 2012 | 2303 | 2032 | 2122 | 1021 | 1102 |
| ×141 | ×131 | ×133 | ×134 | ×142 | ×143 |
| 3402 | 4213 | 2312 | 1323 | 2121 | 2211 |
| ×221 | ×222 | ×223 | ×231 | ×234 | ×311 |
| 2313 | 1322 | 2122 | 2331 | 2332 | 1221 |
| ×312 | ×313 | ×314 | ×322 | ×323 | ×324 |
| 1232 | 3132 | 2313 | 1221 | 1122 | 2122 |
| ×331 | ×332 | ×333 | ×334 | ×341 | ×342 |
| 2143 | 3124 | 4132 | 2314 | 1423 | 1342 |
| ×234 | ×432 | ×342 | ×243 | ×423 | ×324 |
| 3214 | 3343 | 3214 | 3443 | 2412 | 2324 |
| ×235 | ×216 | ×345 | ×226 | ×245 | ×435 |
| 2453 | 2354 | 3245 | 5234 | 2543 | 3425 |
| ×325 | ×435 | ×343 | ×254 | ×343 | ×435 |
| 3142 | 4312 | 2543 | 3452 | 5342 | 3524 |
| ×335 | ×236 | ×326 | ×346 | ×246 | ×253 |

## REVIEW A

1. $104{,}976 \div 243 = ?$
2. $109{,}782 \div 321 = ?$
3. $643 \times 208 = ?$
4. $594 \times 405 = ?$
5. Change $\frac{32}{48}$, $\frac{54}{144}$, $\frac{40}{96}$ to lower terms.
6. Change to 48ths: $\frac{1}{6}$, $\frac{2}{3}$, $\frac{5}{12}$, $\frac{3}{8}$.
7. Add $1\frac{11}{30}$ and $31\frac{1}{30}$, and subtract $17\frac{7}{30}$ from the sum.
8. $96\frac{2}{25} + 88\frac{7}{25} + 39\frac{1}{25} + 47\frac{3}{25} = ?$
9. If I can save \$104.51 in 7 mo., how much can I save in a year?
10. How much will be left from \$100 after spending \$3.60, \$11.17, 50 cents, \$1.96, \$6.40, \$8.33, \$29.08, and 98 cents?
11. A man is paid a salary of \$2160. If he works only 288 days in a year, how much does he receive per day?
12. It takes a postman 6 hours for the collection of mail, but an automobile can do it in $\frac{2}{5}$ of the time. How many minutes does the auto save?
13. $95{,}876 + 10{,}795 + 795 + 6589 + 117{,}894 = ?$
14. Find the difference between six thousand eight hundred sixty-five and seven thousand two hundred forty-one.
15. $134{,}784 \div 234 = ?$
16. $83{,}790 \div 342 = ?$
17. $958 \times 304 = ?$
18. $687 \times 579 = ?$

## REVIEW A—*Continued*

19. Add $69\frac{9}{35}$ and $58\frac{7}{35}$. (*b*) From $94\frac{18}{35}$ take $47\frac{11}{35}$.

20. Reduce $\frac{48}{84}$, $\frac{33}{90}$, $\frac{27}{75}$, $\frac{15}{54}$, $\frac{14}{28}$, $\frac{28}{44}$ to lower terms.

21. Change to 72nds: $\frac{8}{9}$, $\frac{7}{12}$, $\frac{5}{6}$, $\frac{3}{4}$, $\frac{1}{3}$, $\frac{5}{8}$, $\frac{7}{18}$, $\frac{5}{24}$.

22. A man died in 1871 at the age of 86. In what year was he born?

23. A man had 96 horses. Three died and the others were sold at \$105 each. What sum was received for them?

24. A man having \$10,000, kept \$307 and with the rest bought land at \$359 an acre. How many acres did he buy?

25. How many machines worth \$45 each, equal the value of 117 watches at \$65 each?

26. How many 20-gallon casks can be filled from 395 bbl. of molasses of 48 gal. each?

27. A man drew \$22,500 from the bank. He spent $\frac{5}{9}$ of it for a farm and the remainder for a house. How much did he spend for each?

28. At 20¢ a quart, what is the value of 4 bu. of chestnuts?

29. A lady bought 24 yd. of silk for \$34.80. How much would 65 yd. cost at the same price per yard?

30. If an automobile runs 254 mi. a day, how many whole days will it take it to run to San Francisco, a distance of 3097 mi., and how many miles would be left for the last day?

31. Find the cost of 4 doz. lemons at 3¢ apiece.

32. $243{,}648 \div 576 = ?$

## REVIEW A—*Continued*

33. $232{,}578 \div 657 = ?$

34. $975 \times 509 = ?$

35. $867 \times 684 = ?$

36. A man bought 360 sheep. He sold $\frac{2}{3}$ of them at \$4.35 each. How much did he receive for them?

37. Frank earned \$17, which was \$8.75 more than Harry earned. How much did Harry earn?

38. The sum of two numbers is 7423, and one of them is 2567. What is the other?

39. A stock dealer bought 465 sheep at \$4.85 a head and sold them all for \$2875. How much did he gain or lose?

40. Add XLVII, XCIV, CCLXIX, CXCIX, CCXXVIII.

## DENOMINATE NUMBER DRILLS

*Without copying the figures, write as many answers as possible to the following drills, in the time given. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with successive trials. Note improvement in* **speed** *and* **accuracy.**

| *A* | *B* | *C* |
|---|---|---|
| 5280 ft. = ? | 1760 yd. = ? | 60 sec. = ? |
| 320 rd. = ? | 8 qt. = ? | 12 in. = ? |
| 32 qt. = ? | 3 ft. = ? | 365 da. = ? |
| 60 min. = ? | ? oz. in $\frac{1}{2}$ lb. | ? sec. = 1 min. |
| 7 da. = ? | 28–31 da. = ? | ? pk. = 1 bu. |
| ? oz. = 1 lb. | 4 oz. = ? | 36 in. = ? |
| 1 pk. = ? | ? qt. = 1 gal. | 2 pt. = ? |
| 24 hr. = ? | 1 hr. = ? min. | 8 oz. = ? |
| 16 oz. = ? | 1 yr. = ? mo. | 1 bu. = ? qt. |
| 4 qt. = ? | 24 hr. = ? | ? rd. = 1 mi. |
| ? da. = 1 wk. | ? yd. = 1 mi. | 4 pk. = ? |
| 12 things = ? | 3 ft. = ? | |
| 1 mi. = ? ft. | | |

*How do you change*

| | | |
|---|---|---|
| pk. to bu. ? | rd. to mi. ? | bu. to pk. ? |
| ft. to yd. ? | in. to yd. ? | qt. to gal. ? |
| yd. to in. ? | gi. to pt. ? | lb. to oz. ? |
| mi. to rd. ? | pt. to qt. ? | ft. to in. ? |
| qt. to pt. ? | oz. to lb. ? | pt. to gi. ? |
| gal. to qt. ? | things to doz. ? | yd. to mi. ? |

## LESSON 13

### ORAL

1. $3\frac{1}{2}+4\frac{1}{2}=?$
2. $\frac{20}{24}=\frac{?}{6}$
3. When $\frac{2}{3}$ of \$12 is spent, how much is left?
4. Add forty-four and twenty-eight.
5. $17\times3=?$

### WRITTEN

1. From $98\frac{1}{12}$ subtract $69\frac{5}{12}$.
2. $1000\frac{7}{8}-986\frac{5}{8}=?$
3. I had $\$98\frac{3}{4}$ in the bank. I drew out $\$79\frac{1}{4}$. How much was left?
4. Mr. B. had $\$468\frac{7}{8}$ in the bank. He drew out $\$248\frac{3}{8}$. How much was left?
5. Add $16\frac{4}{13}$, $17\frac{2}{13}$, $27\frac{7}{13}$.
6. A farmer raised 488 bu. of wheat. He sold $\frac{5}{8}$ of them. How many bushels had he left?
7. Reduce to lower terms $\frac{16}{24}$, $\frac{28}{48}$, $\frac{18}{60}$.
8. At \$.40 a rod, what will a mile of wire fence cost?
9. In an orchard of 275 trees, $\frac{3}{11}$ are pear trees. How many pear trees are there?
10. Add four hundred thousand six; forty-nine thousand eight; two hundred six thousand sixteen; eighty-seven; five; one hundred sixty-eight thousand seventy-nine.

## LESSON 14

### ORAL

1. $24 \times ? = 72?$
2. $3 \times 20 = ?$
3. Change $\frac{3}{4}$ to 12ths.
4. Find $\frac{3}{10}$ of 30.
5. How many ounces are there in 2 lb.?

### WRITTEN

1. $86\frac{7}{12} - 49\frac{5}{12} = ?$
2. A man bought $57\frac{9}{11}$ yd. of silk and satin. There were $38\frac{5}{11}$ of satin. How many yards of silk were there?
3. Mr. Smith had $486\frac{9}{10}$ bu. of corn. He sold 76 bu. and $98\frac{3}{10}$. How many bushels had he left?
4. $16\frac{1}{5} + 18\frac{2}{5} + 19\frac{2}{5} = ?$
5. In a box containing 240 crayons, $\frac{3}{10}$ are colored and the rest are black. How many black ones are there?
6. $60{,}368 \div 308 = ?$
7. A man had \$308 in the bank. He drew out $\frac{3}{4}$ of it. How much was left?
8. What is the value of 34 lb. of cloves at \$.05 per ounce?
9. Reduce the fraction $\frac{2}{3}$ to 18ths; to 24ths.
   Reduce the fraction $\frac{3}{4}$ to 24ths; to 32nds.
10. Add 309,600; 49,846; 270,027; 100,050; 9900; 48, and 204,040.

## TYPE VII

### REDUCTION OF IMPROPER FRACTIONS TO WHOLE OR MIXED NUMBERS

*A fraction whose numerator is smaller than its denonimator is called a* **proper fraction.**

*A fraction whose numerator equals or is larger than its denominator is called an* **improper fraction.**

**1.** $\frac{4}{2} = ?$

(*a*) 2 halves = one.

(*b*) 4 halves equals as many ones as there are 2's in 4. $4 \div 2 = 2$; therefore $\frac{4}{2} = 2$.

**2.** $\frac{8}{4} = ?$

(*a*) 4 quarters = one.

(*b*) 8 quarters equal as many ones as there are 4's in 8. $8 \div 4 = 2$; therefore $\frac{8}{4} = 2$.

**3.** $\frac{13}{4} = ?$

**4.** Reduce $\frac{8}{2}$ to a mixed number.

**5.** Reduce to mixed numbers $\frac{5}{3}$, $\frac{7}{5}$, $\frac{18}{4}$, $\frac{21}{4}$, $\frac{235}{15}$, $\frac{490}{80}$.

**6.** Reduce to whole or mixed numbers $\frac{36}{9}$, $\frac{111}{11}$, $\frac{84}{7}$.

## TYPE VIII

### ADDITION OF FRACTIONS AND MIXED NUMBERS WHEN THE SUM OF THE FRACTIONS IS MORE THAN A UNIT

1. Add $\frac{3}{4}$ and $\frac{2}{4}$.

*Reduce the sum to a mixed number.* $\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$.

2. $\frac{3}{11} + \frac{5}{11} + \frac{7}{11} = ?$ 3. Find the sum of $3\frac{5}{8}$, $2\frac{3}{8}$, and $5\frac{7}{8}$.

4. John earned $\$2\frac{3}{4}$ one day, $\$3\frac{3}{4}$ another day, and $\$1\frac{1}{4}$ a third day. How much did he earn in all?

## LESSON 15

### ORAL

1. $1\frac{2}{3}+1\frac{2}{3}=?$
2. A peck measure is $\frac{3}{4}$ full. How many quarts are needed to fill it?
3. $76-29=?$
4. $3\times15=?$
5. How many 2's are there in 84?

### WRITTEN

1. Add $14\frac{5}{12}$, $16\frac{7}{12}$, and $18\frac{1}{12}$.
2. $\frac{9}{21}+\frac{7}{21}+\frac{12}{21}=?$
3. Find the sum of $4\frac{3}{8}$, $1\frac{5}{8}$ and $\frac{7}{8}$.
4. Subtract $469\frac{4}{11}$ from $800\frac{9}{11}$.
5. B. exchanged a farm of $448\frac{5}{8}$ acres for a farm of $600\frac{7}{8}$ acres. How many more acres were there in the second farm than in the first?
6. A Kansas farmer owned $640\frac{4}{5}$ acres of land. He sold $289\frac{3}{5}$ acres. How many acres had he left?
7. $\frac{2}{3}$ of a stock of goods worth \$1329 were destroyed by fire. What was the value of the goods that were saved?
8. An engineer travels 325 mi. on each trip. How many trips has he made when he has traveled 131,950 mi.
9. A farmer who has raised 4500 bu. of wheat, sells $\frac{4}{15}$ of it to one man, and $\frac{7}{15}$ of it to another. How many bushels has he left?
10. At an auction sale of thoroughbred horses, 486 of them were sold for \$18,954. What was the average price received for each horse?

## LESSON 16

### ORAL

1. $2\frac{3}{4}+3\frac{3}{4}=?$
2. $27\div 10=?$
3. The multiplier is 3; the product is 63. What is the multiplicand?
4. How much is $\frac{3}{5}$ of 45?
5. $\frac{2}{3}=\frac{?}{15}$?

### WRITTEN

1. Add $6\frac{13}{14}$, $4\frac{5}{14}$, and $18\frac{1}{14}$.
2. Find the sum of $3\frac{2}{7}$, $4\frac{3}{7}$, $9\frac{6}{7}$, and $1\frac{5}{7}$.
3. Add $14\frac{5}{11}$, $27\frac{2}{11}$, and $16\frac{8}{11}$.
4. Subtract $168\frac{4}{9}$ from $245\frac{7}{9}$.
5. A man weighed last year $200\frac{3}{4}$ lb. This year he weighs $168\frac{1}{4}$ lb. How much has he gained or lost in weight?
6. Of 1000 tons of coal, $\frac{3}{5}$ is chestnut size. The rest is stove size. How many tons are there of each size?
7. $180{,}544\div 364=?$
8. John has $9\frac{7}{9}$ mi. to go to his work. He rides $8\frac{5}{9}$ mi. and walks the remaining distance. How many miles does he walk?
9. In $\frac{8}{9}$ there are how many 27ths?

   In $\frac{4}{7}$ there are how many 56ths?

   Change $\frac{5}{11}$ to a fraction having 88 for its denominator.
10. If the multiplier is 15 and the product is 6120, what is the multiplicand?

## REVIEW IV

1. Divide 259,008 by 456.

2. Add $7\frac{3}{5}$, $4\frac{2}{5}$, and $70\frac{4}{5}$.

3. What is the remainder when 392,040 is divided by 529?

4. Subtract $287\frac{7}{16}$ from $513\frac{13}{16}$.

5. A grocer bought 48 bu. of onions at 55¢ a bushel and sold them at \$.15 a peck. Find his gain.

6. A man bought two farms for \$8750, paying \$3975 for one of them. How much did he pay for the other?

7. A railroad has a mileage of 948 mi. in two states, $\frac{5}{12}$ in one and the rest in the other. How many miles has it in each state?

8. Reduce to lowest terms $\frac{27}{36}$, $\frac{54}{60}$, $\frac{20}{36}$.

9. Change to 60ths $\frac{3}{5}$, $\frac{4}{15}$, $\frac{3}{20}$, $\frac{7}{12}$.

10. Add 19,007; 230,040; 65,908; 5987; 105,694.

## DIVISION DRILL

| *A* | *B* |
|---|---|
| 12)398,448 | 13)3,992,677 |
| 13)56,277 | 17)700,485 |
| 14)732,074 | 15)1,245,975 |
| 15)730,465 | 19)2,338,729 |
| 16)1,095,024 | 12)860,508 |
| 17)212,041 | 14)100,366 |
| 18)100,728 | 15)3,107,520 |
| 19)237,025 | 18)890,370 |
| 21)390,054 | 16)2,093,056 |
| 22)13,354,682 | 25)319,075 |
| 23)485,208 | 23)493,005 |
| 24)1,922,328 | 24)2,708,472 |
| 25)150,625 | 25)4,465,400 |

## DIVISION DRILL

### *A*

1. 212)261,608
2. 122)394,182
3. 141)283,692
4. 221)751,842
5. 312)721,656
6. 331)407,792
7. 213)492,456
8. 121)389,983
9. 131)301,693
10. 222)935,286
11. 313)413,786
12. 332)1,033,184
13. 321)395,151
14. 124)274,288
15. 133)270,256
16. 223)515,576
17. 314)666,308
18. 333)770,229

### *B*

1. 132)305,184
2. 211)722,253
3. 134)284,348
4. 231)305,613
5. 322)750,582
6. 334)407,814
7. 233)308,026
8. 214)473,368
9. 142)144,982
10. 234)496,314
11. 323)753,236
12. 341)382,602
13. 232)494,624
14. 343)690,116
15. 143)157,586
16. 311)687,621
17. 324)395,604
18. 342)725,724

### *C*

1. 234)501,462
2. 235)755,290
3. 325)797,225
4. 335)1,052,570
5. 432)1,349,568
6. 216)722,088
7. 435)1,023,990
8. 236)1,017,632
9. 342)1,413,144
10. 345)1,108,830
11. 343)1,113,035
12. 326)829,018
13. 243)562,302
14. 226)778,118
15. 254)1,329,436
16. 346)1,194,392
17. 423)601,929
18. 245)590,940

## TYPE IX

*Teach that a number that will exactly contain another number is called a* **multiple** *of that number.*

*Teach that a number that is a multiple of two or more numbers is called a* **common multiple** *of those numbers.*

1. Find a number that will exactly contain 3 and 4.

The multiples of 3 are 3, 6, 9, 12, etc.

The multiples of 4 are 4, 8, 12, 16, etc.

By inspection we find that 12 is a multiple of both 3 and 4. Therefore 12 is a common multiple of 3 and 4.

2. Find a common multiple of 3 and 5.
3. " " " 4 and 5.
4. " " " 3 and 7.
5. " " " 2, 3 and 5.

(*a*) The multiples of 5 are 5, 10, 15, 20, 25, 30, etc.

(*b*) Of these 15 and 30 are multiples of 3.

(*c*) Of these 30 is a multiple of 2.

Therefore 30 is a common multiple of 2, 3, and 5.

6. Find a multiple of 5 which is also a multiple of 3 and 4.
7. Find a common multiple of 3, 5, and 6.

Any multiple of 6 is also a multiple of 3; therefore we need to find only the common multiple of 5 and 6 in order to find a common multiple of 3, 5, and 6.

8. Find a common multiple of 2, 3, 5, and 9.
9. Find a common multiple of 2, 3, 4, 6, and 9.
10. Find a common multiple of 2, 3, 4, 6, and 8.

## LESSON 17

### ORAL

1. Write a common multiple of 4 and 6.

2. The subtrahend is $2\frac{1}{2}$; the remainder is 6. What is the minuend?

3. How many eggs are there in 9 doz.?

4. Change 12 qt. to gallons.

5. How many feet are there in 16 yd.?

### WRITTEN

1. (*a*) Find some number which you can exactly divide by 2, 3, and 4.

(*b*) Find two numbers which will exactly contain 3, 6, and 12.

2. (*a*) What number is a multiple of 4, 5, and 10?

(*b*) Find a common multiple of 3, 6, and 8.

3. (*a*) " " " 5, and 6.

(*b*) " " " 3, 5, and 10.

4. Add $5\frac{9}{13}$, $80\frac{3}{13}$, and $45\frac{11}{13}$.

5. The minuend is $18\frac{17}{24}$; the subtrahend is $18\frac{5}{24}$. What is the remainder?

6. Write Roman numerals for 309, 247, and 385.

7. A hardware dealer bought 15 doz. hammers at \$4.20 a dozen. He sold them at 49¢ each. How much did he gain?

8. One can of condensed milk is made from a quart of milk. How many cans of condensed milk are made from 200 gal. of milk?

9. $5192 \div 88 = ?$

10. At \$.06 a foot, how much will 40 yd. of wire fencing cost?

## LESSON 18

### ORAL

1. $\frac{4}{5} = \frac{?}{15}$
2. Find a common multiple of 2, 3, and 4.
3. How many inches are there in 2 yd.?
4. $? \times 15 = 30$.
5. Add $1\frac{3}{4}$ and $5\frac{3}{4}$.

### WRITTEN

1. Find a common multiple of 8, 12 and 9.

2. Find a common multiple of the denominators of these fractions: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$.

3. (*a*) Find a common multiple of the denominators of these fractions: $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{9}$, $\frac{1}{12}$.

(*b*) And of these: $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{12}$.

4. Reduce $\frac{3}{4}$, $\frac{5}{8}$, and $\frac{1}{2}$ to 24ths.

5. Change $\frac{3}{4}$ and $\frac{4}{5}$ to 20ths.

6. Reduce $\frac{7}{12}$, $\frac{2}{3}$, and $\frac{5}{16}$ to 48ths.

7. From the sum of $4\frac{11}{50}$ and $9\frac{10}{50}$ take $10\frac{21}{50}$.

8. A boy walks $1\frac{3}{4}$ mi. from his home to the butcher's. He than walks to a friend's house, $\frac{1}{4}$ of a mile more. From here he goes home, $2\frac{1}{4}$ mi. How many miles has he gone?

9. A woman bought 9 yd. of hair ribbon and made it up into Christmas presents each containing 54 in. How many did she make?

10. What is the minuend when the subtrahend is 493 and the remainder is 394?

# TYPE X

## ADDITION AND SUBTRACTION OF FRACTIONS WITH DIFFERENT DENOMINATORS

1. Add $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$.

| | |
|---|---|
| $\frac{1}{2}$ | $\frac{6}{12}$ |
| $\frac{1}{3}$ | $\frac{4}{12}$ |
| $\frac{1}{4}$ | $\frac{3}{12}$ |
| $1\frac{1}{12}$ | $\frac{13}{12} = 1\frac{1}{12}$ |

(*a*) Find a common multiple of the denominators 2, 3, and 4.

(*b*) 12 is a common multiple of 2, 3, and 4. 24 is a common multiple of 2, 3, and 4, but 12 is the smaller, therefore we use 12 because it is easier to reduce halves, thirds, and fourths to 12ths.

(*c*) Change each fraction to 12ths.

(*d*) Add the fractions.

2. Add $2\frac{1}{3}$, $1\frac{1}{6}$, and $3\frac{1}{5}$.

| | |
|---|---|
| $2\frac{1}{3}$ | $\frac{10}{30}$ |
| $1\frac{1}{6}$ | $\frac{5}{30}$ |
| $3\frac{1}{5}$ | $\frac{6}{30}$ |
| $6\frac{7}{10}$ | $\frac{21}{30} = \frac{7}{10}$ |

*To add fractions* having different denominators, we must change them to a common denominator and add the fractions obtained.

The smallest denominator to which all the fractions can be reduced is called the *least common denominator*.

3. Add $4\frac{1}{5}$ and $9\frac{1}{4}$.
4. $12\frac{1}{12} + 9\frac{1}{3} = ?$
5. $\frac{1}{8} + \frac{1}{3} + \frac{1}{6} = ?$
6. $9\frac{1}{4} + 5\frac{1}{5} + 7\frac{1}{10} = ?$
7. $8\frac{1}{3} - 4\frac{1}{12} = ?$
8. $12\frac{1}{6} - 9\frac{1}{8} = ?$

## LESSON 19

### ORAL

1. $3 \times 19 = ?$
2. How many 2's in 98?
3. Change $\frac{3}{5}$ to twentieths.
4. $80 - 62 = ?$
5. What will 2 oranges cost when a dozen cost 36¢?

### WRITTEN

1. Add $11\frac{1}{2}$ and $4\frac{1}{4}$.
2. $3\frac{1}{3} + 2\frac{1}{6} = ?$
3. $2\frac{1}{5} - 1\frac{1}{10} = ?$
4. Find the sum of $15\frac{1}{2}$, $4\frac{1}{4}$, and $7\frac{1}{8}$.
5. In two pieces of cloth there are $7\frac{1}{3}$ yd. and $11\frac{1}{4}$ yd. How many yards are there in both?
6. An errand boy traveled $3\frac{1}{3}$ mi. on one delivery, $1\frac{1}{4}$ mi. on another, and $2\frac{1}{6}$ mi. on a third. How many miles did he travel in all?
7. Write the equivalents of CDIX, 468, CDXL, 500.
8. The cost of 6 doz. silver knives is $129.60. What will 24 knives cost?
9. A man owning $4\frac{1}{3}$ acres of land, sold $1\frac{1}{4}$ acres. How many acres had he remaining?
10. A box of figs weighs $35\frac{1}{8}$ lb. The box alone weighs $4\frac{1}{12}$ lb. What is the *net* weight of the figs?

## LESSON 20

### ORAL

1. $4\frac{1}{2}+3\frac{1}{2}=?$
2. What is $\frac{1}{25}$ of 75?
3. $46\times2=?$
4. How many quarts are there in 16 gal.?
5. How many ounces are there in 6 lb.?

### WRITTEN

1. Add $\frac{1}{18}$, $12\frac{1}{3}$, and $6\frac{1}{6}$.
2. $44\frac{1}{24}+77\frac{1}{12}+11\frac{1}{6}=?$
3. During February we burned $11\frac{1}{20}$ tons of coal; during March $10\frac{1}{10}$ tons; and during April, $7\frac{1}{5}$ tons. How many tons were burned during the three months?
4. A train ran $29\frac{1}{7}$ mi. the first hour, $41\frac{1}{14}$ mi. the next, and $30\frac{1}{2}$ mi. the next. How many miles did it run in the three hours?
5. $97{,}990\div478=?$
6. A barrel of flour weighs 196 lb. What does $\frac{3}{8}$ of a barrel weigh?
7. From nine hundred thousand nine, take three hundred thousand three hundred three.
8. A coat that cost $\$5\frac{1}{2}$ was sold at a loss of $\$1\frac{1}{4}$. Find the selling price.
9. How many 5-qt. cans can be filled from a tank containing 160 gal.?
10. A quart of milk weighs 2 lb. A baby takes 4 oz. at each feeding. How many feedings are there in a quart?

## REVIEW V

1. What is the smallest common multiple that you can find of 4, 15, and 20?

2. Write the Roman numerals for 409, 304, 494, 249, and 466.

3. Four loads of hay weigh $1\frac{1}{4}$ tons, $1\frac{1}{5}$ tons, $1\frac{1}{8}$ tons, and $1\frac{3}{10}$ tons. What is the total weight?

4. It is $5\frac{1}{12}$ mi. from here to B., and $4\frac{1}{16}$ mi. to A. How much nearer is A.?

5. A man having \$2560 in the bank, drew out $\frac{5}{8}$ of it and bought with it land at \$25 an acre. How many acres did he buy?

6. A druggist put 24 lb. of material up into 4-oz. packages which he sells at 25¢ a package. If the material cost him \$8, how much will he gain on all?

7. Add $14\frac{1}{6}$, $41\frac{1}{7}$, and $29\frac{1}{3}$.

8. From $42\frac{1}{5}$ take $27\frac{1}{5}$.

9. A business man had on hand this morning \$283.58. He received to-day \$75, \$163.18, and \$94.75. He paid out to-day \$387.88. How much has he on hand?

10. A broker sold 485 shares of stock at \$109 each, and with the money bought shares at \$97 each. How many did he buy?

## DIVISION DRILL

| *A* | *B* | *C* |
|---|---|---|
| 26)811,356 | 41)574,369 | 35)1,146,530 |
| 48)2,011,488 | 27)2,241,729 | 32)2,931,328 |
| 36)30,103,956 | 42)1,919,526 | 28)1,024,632 |
| 44)3,685,044 | 37)765,456 | 34)3,117,902 |
| 38)3,133,518 | 67)3,296,936 | 94)1,963,190 |
| 52)781,924 | 87)5,528,937 | 39)1,446,705 |
| 45)1,916,235 | 49)1,898,848 | 58)3,504,766 |
| 78)4,794,816 | 46)1,880,434 | 47)3,336,624 |

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop on signal. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with successive trials. Note improvement in* **speed** *and* **accuracy.**

| *A* | *B* | *C* | *D* |
|---|---|---|---|
| $\frac{1}{2}$ of 82 = ? | ? ÷ 50 = 2 | 82 ÷ ? = 41 | 2)92 |
| ?)86 | 47)94 | $\frac{1}{2}$ of ? = 50 | ? |
| 43 | ? | 20)? | ? × 43 = 86 |
| ? ÷ 2 = 48 | 44 × ? = 88 | 3 | 2 × ? = 96 |
| 3 × ? = 51 | 2)82 | 94 ÷ ? = 47 | 50)? |
| 80 ÷ ? = 2 | ? | $\frac{1}{2}$ of ? = 46 | 2 |
| 49)98 | 98 ÷ ? = 2 | 2) ? | ? ÷ 2 = 43 |
| ? | ? ÷ 3 = 19 | 45 | 60 ÷ ? = 3 |
| $\frac{1}{20}$ of ? = 3 | 49 × 2 = ? | ? ÷ 3 = 17 | $\frac{1}{18}$ of 54 = ? |
| 3)51 | $\frac{1}{2}$ of 90 = ? | $\frac{1}{3}$ of 57 = ? | 44)? |
| ? | 2)96 | 42)84 | 2 |
| ? × 2 = 90 | ? | ? | 18)54 |
| 54 ÷ ? = 18 | 47 × ? = 94 | $\frac{1}{2}$ of ? = 42 | ? |
| ?)57 | 88 ÷ 44 = ? | ? ÷ 3 = 24 | 75 ÷ 25 = ? |
| 19 | | | |
| 78 ÷ 3 = ? | | | |

## RAPID FACTOR DRILL—*Continued*

| *A* | *B* | *C* | *D* |
|---|---|---|---|
| $\frac{1}{2}$ of 32 = ? | ?)110 | ? ÷ 14 = 2 | 22)? |
| 12 × ? = 144 | 11 | 2 × ? = 32 | 2 |
| ? × 2 = 28 | ? × 2 = 38 | ?)30 | 19)38 |
| 10 × ? = 120 | $\frac{1}{2}$ of 26 = ? | 15 | ? |
| $\frac{1}{10}$ of 110 = ? | $\frac{1}{19}$ of 38 = ? | ? ÷ 17 = 2 | 46 ÷ 23 = ? |
| 32 ÷ 16 = ? | $\frac{1}{11}$ of 121 = ? | 18)36 | 40 ÷ 2 = ? |
| 2)34 | 12)120 | ? | ? × 22 = 44 |
| ? | ? | ? × 2 = 48 | 2 × ? = 46 |
| $\frac{1}{18}$ of ? = 2 | 132 ÷ 11 = ? | 11) ? | 20)? |
| | 144 ÷ ? = 12 | 11 | 2 |

## TYPE XI

**ADDITION AND SUBTRACTION OF FRACTIONS HAVING DIFFERENT DENOMINATORS WITH NUMERATORS MORE THAN ONE**

1. Add $1\frac{2}{3}$ and $2\frac{3}{4}$.

| | |
|---|---|
| 1 | $\frac{2}{3}=\frac{8}{12}$ |
| 2 | $\frac{3}{4}=\frac{9}{12}$ |
| 3 | $\frac{17}{12}=1\frac{5}{12}$. |
| $1\frac{5}{12}$ | |

$4\frac{5}{12}$ *Ans.*

(*a*) Change $\frac{2}{3}$ and $\frac{3}{4}$ to a common denominator.

(*b*) $\frac{2}{3}=\frac{8}{12}$; $\frac{3}{4}=\frac{9}{12}$.

(*c*) The sum of $\frac{8}{12}$ and $\frac{9}{12}$ is $\frac{17}{12}$ or $1\frac{5}{12}$.

(*d*) Add $1\frac{5}{12}$ to the sum, (3), of the whole numbers, making $4\frac{5}{12}$.

2. Add $3\frac{3}{4}$ and $4\frac{5}{6}$.
3. Add $12\frac{3}{5}$ and $9\frac{5}{6}$.
4. Find the sum of $1\frac{2}{3}$ and $5\frac{5}{7}$.
5. $14\frac{5}{7}-9\frac{3}{14}=?$

*To subtract fractions having different denominators,*

(*a*) Change the fractions to a common denominator.

(*b*) Subtract the fractions.

6. From $210\frac{2}{3}$ bu. of grain $118\frac{3}{5}$ bu. were sold. How many bushels were left?
7. From $25\frac{3}{5}$ take $8\frac{3}{8}$.
8. $16\frac{3}{4}-9\frac{1}{2}=?$

## LESSON 21

### ORAL

1. Find the sum of $3\frac{2}{3}$ and $2\frac{2}{3}$.
2. $15 \times 5 = ?$
3. $6 \times ? = 90$.
4. What change should I receive from a quarter after buying a quart of milk for 9¢ and a loaf of bread for 5¢?
5. How many pecks are there in 17 bu.?

### WRITTEN

1. Add $14\frac{2}{3}$ and $7\frac{3}{4}$.
2. Find the sum of $18\frac{11}{24}$, $20\frac{5}{8}$, and 10.
3. In one bin there are $11\frac{5}{12}$ bu. of oats, in a second $17\frac{2}{3}$ bu., and in a third $40\frac{5}{16}$ bu. How many bushels are there in all?
4. From a piece of goods there were cut $7\frac{11}{18}$ yd., $9\frac{1}{6}$ yd., and $14\frac{5}{9}$ yd. How many yards in all were cut from the piece?
5. A boy rode on his bicycle $15\frac{2}{3}$ mi. one day, $9\frac{3}{4}$ mi. the next, and $10\frac{5}{9}$ mi. the next. How many miles did he ride?
6. An overcoat cost $\$28\frac{3}{4}$ and a suit cost $\$15\frac{5}{8}$. How much more than the suit did the overcoat cost?
7. At $1.45 each, what will 9 ash cans cost?
8. Divide 43,625 by 125.
9. I go to the store with $10 and buy the following: 1 screen door for $1.75; 1 pair hinges for $.25; a lock for $.45; and 15 lb. nails at $.09 a pound. How much change should I receive?
10. A peddler bought 16 bu. of apples for $24. He sold them at 50¢ a peck. What profit did he make?

## LESSON 22

### ORAL

1. How many hours are there in 3 days?
2. What remains when 17 is taken from 60?
3. $49 + 36 = ?$
4. If the railroad fare for 6 people is 84¢, what will the same trip cost 4 people?
5. Find $\frac{3}{4}$ of 56.

### WRITTEN

1. Find the sum of $5\frac{7}{27}$, $11\frac{1}{3}$, and $4\frac{2}{3}$.
2. $14\frac{3}{11} + 29\frac{9}{22} + 43\frac{1}{2} = ?$
3. $14\frac{2}{3} - 5\frac{2}{5} = ?$
4. Take $7\frac{3}{8}$ from $10\frac{2}{3}$.
5. Four loads of coal weighed respectively $3\frac{2}{5}$ tons, $2\frac{1}{4}$ tons, $2\frac{7}{10}$ tons, and $4\frac{3}{20}$ tons. What was the total weight?
6. In a bicycle race the riders average 30 mi. per hour. How far has a rider gone when he has ridden steadily for 2 days?
7. What will a merchant pay for 24 woollen blankets at $9.75 each?
8. Add twenty thousand ninety-three; four thousand five hundred; four hundred ten thousand one hundred two; one hundred eighty thousand.
9. $625 is the cost of 25 miles of telephone wire. How many miles can be built for $1950?
10. A ton of coal weighs 2000 lb. What will $\frac{3}{4}$ of a ton weigh?

## LESSON 23

### ORAL

1. How many bushels are there in 80 pk.?
2. $15 \times 6 = ?$
3. A grocer buys butter at 25¢ a pound and sells it for 32¢ a pound. What is his profit on 10 lb.?
4. If a man gives a ten-dollar bill in payment for a hat at $\$3\frac{1}{2}$ and shoes at $\$4\frac{1}{2}$, what change does he receive?
5. Take the sum of 18 and 15 from 45.

### WRITTEN

1. From $16\frac{7}{8}$ take the sum of $4\frac{1}{3}$ and $7\frac{1}{6}$.
2. Take the sum of $8\frac{1}{2}$ and $9\frac{1}{4}$ from $20\frac{7}{8}$.
3. From a bar of platinum $9\frac{11}{12}$ in. long, a jeweler cut two pieces, one $3\frac{1}{2}$ in. long and the other $4\frac{1}{4}$ in. long. How much was left of the original piece?
4. I bought $65\frac{7}{8}$ yd. of silk. I sold $9\frac{3}{8}$ yd. at one time and $4\frac{1}{4}$ yd. at another time. How many yards were left?
5. In a farm of $80\frac{17}{18}$ acres, $24\frac{4}{9}$ acres were in hay, $30\frac{1}{6}$ acres in pasture, and the remainder in woodland. How many acres of woodland were there?
6. A butcher sold to three customers $14\frac{3}{8}$ lb., $16\frac{1}{4}$ lb., and $14\frac{1}{6}$ lb. How many pounds did he sell in all?
7. Add two hundred thousand four; twenty-seven thousand eight; three hundred nine thousand sixty-nine; fifty-seven thousand five hundred; nine thousand four hundred eighty-seven; twenty-four thousand forty; sixty thousand six hundred; eighty-nine; three thousand fourteen.
8. A merchant purchased 22 dresses, at $4.28 each, which he sold for $8 each. What was his gain?
9. A peck of potatoes weighs 15 lb. How many bushels are there in 300 lb.?
10. Divide 84,425 by 307.

## LESSON 24

### ORAL

1. How many minutes are there in a quarter of an hour?
2. How many yards are there in 48 ft.?
3. Find $\frac{5}{11}$ of 88.
4. $2 \times 17 = ?$
5. How many 14's are there in 98?

### WRITTEN

1. A side of beef weighs $267\frac{3}{4}$ lb. The butcher cuts from it $112\frac{3}{8}$ lb. and $8\frac{1}{16}$ lb. How many pounds are left?
2. Take $8\frac{1}{12}$ from the sum of $14\frac{1}{2}$ and $5\frac{3}{4}$.
3. A man had $\$75\frac{9}{10}$. He spent $\$29\frac{1}{2}$ at one time and $\$10\frac{1}{8}$ at another. How much has he left?
4. How many hours are there in 2160 min.?
5. Add forty thousand nine; two hundred eight thousand eighty; fifty-seven thousand five hundred; four thousand eighty-nine; four hundred thirty thousand two hundred three; ninety-six; one thousand ten.
6. $435 \times 208 = ?$
7. If 64 school desks cost \$768, how many desks can be bought for \$240?
8. Mr. Barnes had \$8910 in the bank. He drew out $\frac{4}{11}$ of it to invest in business. How much remained in the bank?
9. A race track is 2640 ft. long. How many yards in length is the track?
10. $241{,}072 \div 247 = ?$

## REVIEW VI

1. Add \$647.93, \$75, \$394.87, \$2568.17, \$952.73, and \$69.08.

2. In a piece of beef there are $75\frac{3}{16}$ lb. A butcher sells $8\frac{1}{4}$ lb. to one customer and $12\frac{1}{8}$ lb. to another. How many pounds are left?

3. A boy picked 18 qt. of berries which he sold at 13¢ a quart. He put $\frac{5}{9}$ of this money in his bank. How much did he put in the bank?

4. A seedsman exchanged 48 bu. of wheat worth 87¢ a bushel for 72 bu. of seed corn. How much was the corn worth per bushel?

5. I bought: books, \$1.35; pencils, 20¢; paper and envelopes, 89¢; pens, 8¢. What change should I receive from \$5.

6. My grocer bought 8 bu. of potatoes at 75¢ per bushel and sold them at 8¢ a quart. How much did he gain?

7. A dealer had $49\frac{1}{2}$ yd. of muslin. He sold $15\frac{1}{3}$ yd. and $8\frac{1}{6}$ yd. How many yards had he left?

8. A merchant had on hand this morning \$93.41. He has received to-day \$308.79. He has paid out \$295.55. What is his balance now?

9. At the post-office I bought 28 two-cent stamps, 33 one-cent stamps, two ten-cent stamps, 50 post cards, and 25 envelopes for 54¢. What change did I get from \$5?

10. A merchant's daily receipts average \$583. What will 78 days' receipts amount to?

## ADDITION DRILL

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| 47,362 | 58,062 | 62,436 | 27,195 | 49,865 |
| 87,495 | 73,498 | 59,872 | 41,863 | 93,745 |
| 36,507 | 26,544 | 43,088 | 87,956 | 28,145 |
| 29,846 | 78,362 | 59,764 | 48,329 | 30,947 |
| 38,052 | 94,703 | 78,236 | 82,855 | 74,156 |
| 81,663 | 86,492 | 95,486 | 64,728 | 92,134 |
| 23,649 | 29,732 | 56,349 | 12,863 | 95,746 |
| 27,844 | 46,648 | 78,246 | 94,267 | 12,374 |
| 36,592 | 97,395 | 37,958 | 35,488 | 86,946 |
| 84,663 | 27,633 | 87,362 | 92,904 | 24,164 |
| 72,989 | 43,806 | 74,893 | 60,554 | 99,786 |
| 72,556 | 94,724 | 28,096 | 37,269 | 87,967 |
| 25,649 | 30,095 | 36,425 | 27,365 | 87,354 |
| 37,824 | 43,762 | 87,492 | 72,864 | 42,536 |
| 82,645 | 28,973 | 34,256 | 42,877 | 97,865 |
| 93,782 | 64,587 | 58,577 | 39,628 | 56,453 |
| 64,537 | 86,435 | 29,763 | 34,780 | 12,437 |
| 42,836 | 40,809 | 42,855 | 92,798 | 92,431 |
| 29,988 | 37,256 | 49,973 | 36,542 | 42,356 |
| 34,736 | 42,845 | 65,728 | 72,899 | 12,134 |
| 48,527 | 64,078 | 92,807 | 77,450 | 11,098 |

## ADDITION DRILL—*Continued*

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| 75,648 | 76,846 | 978,675 | $7,685.76 | $87.65 |
| 7,354 | 34,251 | 645,867 | 453.65 | 7,691.98 |
| 42,536 | 46,598 | 64,531 | 546,328.85 | 756.90 |
| 64,539 | 2,439 | 537,289 | 6,574.00 | 7.98 |
| 534 | 4,658 | 756,484 | 8,673.08 | 654.76 |
| 63,425 | 465 | 123,451 | 756.11 | 87.09 |
| 7,564 | 54,988 | 7,564 | 686,452.75 | 542.09 |
| 6,453 | 42,301 | 761,453 | 758.90 | 87.43 |
| 34,256 | 6,591 | 6,513 | 768,453.86 | 52.72 |
| 5,397 | 75 | 751,671 | 6,503.05 | 762.54 |
| 86,751 | 645,808 | 6,451 | 756.72 | 54.87 |
| 45,371 | 65,879 | 756,432 | 760.83 | 7.78 |

## REVIEW B

1. Find the sum of 2198, 587, 1059, 2165, 388, and 2469.

2. One loaf of bread will feed 3 men a day. How many loaves will be needed for 30 men for a week?

3. Traveling at the rate of 42 mi. an hour, a train can reach Chicago in 24 hours. How fast must it run per hour to arrive there in 18 hr.?

4. Subtract twenty-four thousand three hundred five from one hundred sixteen thousand twenty-two.

5. A day's work for an engineer is 138 mi. During this month he has a mileage of 3726 mi. At $4 a day what did he earn?

6. $389 \times 204 = ?$

7. If a train ran continuously for 2 days at 30 mi. an hour, how far would it go?

8. Divide 119,552 by 467.

9. A dealer bought 5 doz. ties at $1.95 per dozen, 4 doz. hats at $22 per dozen, and 2 doz. overalls at $4 per dozen. What was the total cost?

10. He sold the ties at 25¢ each, the hats at $2.50 each, and the overalls at 60¢ per pair. What did he receive for all?

11. $16{,}872 + 19{,}005 + 8267 + 23{,}584 + 995 + 18{,}096 = ?$

12. A speculator bought 125 acres of land at $60 an acre. He spent $1250 in fencing it and then sold it at a gain of $1000 over all the cost. For what did he sell it?

## REVIEW B—*Continued*

13. 63,017 − 28,759 = ?

14. What is the value of 3 bales of cotton, each weighing 397 lb., at 9¢ a pound?

15. Multiply one hundred seventy-nine by five hundred eight.

16. I bought 2 shirts @ $1.25, 2 shirts @ $.88, 6 collars at $1.50 a dozen, 1 tie for 75¢. What change did I receive from $10?

17. 427,302 ÷ 579 = ?

18. There are 4 tubs of butter weighing $39\frac{5}{8}$ lb., $35\frac{7}{8}$ lb., $31\frac{1}{4}$ lb., and $33\frac{1}{2}$ lb. How much do they all weigh?

19. A huckster bought 18 bu. of apples at 80¢ a bushel. He sold 8 bu. at 30¢ a peck and the remainder at 40¢ a peck. What was his gain?

20. Add six thousand ninety; two thousand one hundred five; five hundred seventy-nine; one thousand sixty-eight; six hundred fifty-four; two thousand sixty-nine.

21. What is the cost of 8 oz. of butter @ 32¢ a pound and 4 oz. of tea at 64¢ a pound?

22. Find the difference between 35,879 and 123,451.

23. A grocer bought a 10-gal. can of milk for $1.50. He retailed it at 6¢ a quart. How much was his gain?

24. 547 × 59 = ?

25. Find the cost of $\frac{7}{12}$ of an acre of land at $84 an acre.

26. Multiply 24 by 54 and divide the product by 36.

REVIEW B—*Continued*

**27.** A street is 352 yd. long. How many feet long is it?

28. 8793 plus 3859 − 8976 = ?

29. I bought sugar for 32¢, tea for 38¢, coffee for 34¢, eggs for 36¢, butter for 43¢. What change did I receive from $2?

30. Find the difference between the sum of 8670 and 654 and the sum of 639 and 784.

31. A farmer has his land in four parcels containing $7\frac{1}{6}$ acres, $15\frac{3}{8}$ acres, $9\frac{5}{12}$ acres, and $24\frac{1}{2}$ acres. How many acres has he in all?

32. A man's income is $1800 a year. His average expenses are $116.50 a month. How much can he save in a year?

33. Write in Roman numerals 375, 483, 224.

34. Add $43\frac{3}{4}$ and $15\frac{5}{6}$.

35. A merchant's receipts for the week are as follows: $47.83, $32.17, $58.85, $19.67, $27.91, $75.83. What are his total receipts?

36. Subtract $27\frac{2}{3}$ from $41\frac{3}{4}$.

37. What is the product of 315 times 89?

38. Georgia has an area of 59,475 sq. mi., New York has an area of 49,170 sq.mi. How much larger is Georgia than New York?

39. How many yards in 624 ft.?

40. A contractor completed in one week $1\frac{3}{4}$ mi. of road: the next week $2\frac{1}{8}$ mi., the next, $1\frac{1}{2}$ mi., and the

## REVIEW B—*Continued*

next, $1\frac{5}{8}$ mi. How many miles were done in the four weeks?

41. A farmer had 63 cows. $\frac{2}{9}$ of them died. He sold the remainder @ $35 each. How much did he receive?

42. Four casks were gauged and marked as follows: $31\frac{1}{2}$ gal., $31\frac{5}{8}$ gal., $31\frac{1}{4}$ gal., $31\frac{9}{16}$ gal. What was the total capacity of the four casks?

43. If 6 bbl. of flour cost $58.80, what will 5 bbl. cost?

44. A picture has two sides, each $12\frac{1}{2}$ in. long, and two sides, each $8\frac{3}{4}$ in. long. How many inches of molding will it take to frame it? (diagram)

45. A dealer bought 46 tons of coal @ $4.75 a ton. If he sells it at $6.25 a ton, how much will he gain?

46. A man owning $51\frac{7}{8}$ acres of land sold $12\frac{1}{2}$ acres. How much had he left?

47. A man has $160. How many days at $5 per day must he work to increase that sum to $500?

48. A butcher bought 71 lb. of beef at 11¢, 42 lb. of bacon at 16¢, and 34 lb. of pork at 12¢. How much was his bill?

49. A farmer exchanged 84 doz. eggs for 20 yd. of carpet @ 63¢ a yard. What were the eggs worth per dozen?

50. Divide 436,158 by 738.

## DENOMINATE NUMBER DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Write for 5 minutes. Start and stop on signal. Score 5 for each correct answer. Keep results and compare with successive trials. Try for improvement in* **speed** *and* **accuracy**.

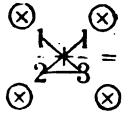
| *A* | *B* | *C* |
|---|---|---|
| ? oz. = 1 lb. | 1 pk. = ? | 24 hr. = ? |
| 16 oz. = ? | 4 qt. = ? | ? days = 1 wk. |
| 12 things = ? | 1 mi. = ? ft. | ? qt. = 1 gal. |
| 1 hr. = ? min. | 1 yr. = ? mo. | 24 hr. = ? |
| ? yd. = 1 mi. | 3 ft. = ? | 4 oz. = ? |
| 28–31 da. = ? | ? oz. = $\frac{1}{2}$ lb. | 3 ft. = ? |
| 8 qt. = ? | 1760 yd. = ? | 60 sec. = ? |
| 12 in. = ? | 365 da. = ? | ? sec. = 1 min. |
| ? pk. = 1 bu. | 36 in. = ? | 2 pt. = ? |
| 8 oz. = ? | 1 bu. = ? qt. | ? rd. = 1 mi. |
| 4 pk. = ? | 5280 ft. = ? | 7 da. = ? |
| 60 min. = ? | ? qt. = 1 bu. | 320 rd. = ? |
| 32 qt. = ? | 5280 ft. = ? | |

*How do you change*

| | | |
|---|---|---|
| rd. to mi.? | gi. to pt.? | things to doz.? |
| in. to yd.? | pt. to qt.? | lb. to oz.? |
| qt. to gal.? | qt. to gal.? | yd. to in.? |
| ft. to yd.? | bu. to pk.? | ft. to in.? |
| pk. to bu.? | oz. to lb.? | pt. to gi.? |
| yd. to mi.? | mi. to rd.? | |

## FRACTION DRILL I

### Short Method

$\frac{1}{2}+\frac{1}{3}=?$  $= \frac{(1\times2)+(1\times3)}{(3\times2)} = \frac{(3+2)}{6} = \frac{5}{6}.$

Rule: *Add the denominators for the numerator of the answer. Multiply the denominators for the denominator of the answer.*

$\frac{1}{2}+\frac{1}{2}=?$
$\frac{1}{2}+\frac{1}{3}=?$
$\frac{1}{2}+\frac{1}{4}=?$
$\frac{1}{2}+\frac{1}{5}=?$
$\frac{1}{2}+\frac{1}{6}=?$
$\frac{1}{2}+\frac{1}{7}=?$
$\frac{1}{2}+\frac{1}{8}=?$
$\frac{1}{2}+\frac{1}{9}=?$
$\frac{1}{2}+\frac{1}{10}=?$
$\frac{1}{2}+\frac{1}{12}=?$
$\frac{1}{3}+\frac{1}{3}=?$
$\frac{1}{3}+\frac{1}{4}=?$
$\frac{1}{3}+\frac{1}{5}=?$
$\frac{1}{3}+\frac{1}{6}=?$
$\frac{1}{3}+\frac{1}{7}=?$
$\frac{1}{3}+\frac{1}{8}=?$
$\frac{1}{3}+\frac{1}{9}=?$

$\frac{1}{3}+\frac{1}{10}=?$
$\frac{1}{3}+\frac{1}{12}=?$
$\frac{1}{4}+\frac{1}{4}=?$
$\frac{1}{4}+\frac{1}{5}=?$
$\frac{1}{4}+\frac{1}{6}=?$
$\frac{1}{4}+\frac{1}{7}=?$
$\frac{1}{4}+\frac{1}{8}=?$
$\frac{1}{4}+\frac{1}{9}=?$
$\frac{1}{4}+\frac{1}{10}=?$
$\frac{1}{4}+\frac{1}{12}=?$
$\frac{1}{5}+\frac{1}{5}=?$
$\frac{1}{5}+\frac{1}{6}=?$
$\frac{1}{5}+\frac{1}{7}=?$
$\frac{1}{5}+\frac{1}{8}=?$
$\frac{1}{5}+\frac{1}{9}=?$
$\frac{1}{5}+\frac{1}{10}=?$
$\frac{1}{5}+\frac{1}{12}=?$
$\frac{1}{6}+\frac{1}{6}=?$

$\frac{1}{6}+\frac{1}{7}=?$
$\frac{1}{6}+\frac{1}{8}=?$
$\frac{1}{6}+\frac{1}{9}=?$
$\frac{1}{6}+\frac{1}{10}=?$
$\frac{1}{6}+\frac{1}{12}=?$
$\frac{1}{7}+\frac{1}{7}=?$
$\frac{1}{7}+\frac{1}{8}=?$
$\frac{1}{7}+\frac{1}{9}=?$
$\frac{1}{7}+\frac{1}{10}=?$
$\frac{1}{7}+\frac{1}{12}=?$
$\frac{1}{8}+\frac{1}{8}=?$
$\frac{1}{8}+\frac{1}{9}=?$
$\frac{1}{8}+\frac{1}{10}=?$
$\frac{1}{8}+\frac{1}{12}=?$
$\frac{1}{9}+\frac{1}{9}=?$
$\frac{1}{9}+\frac{1}{10}=?$
$\frac{1}{9}+\frac{1}{12}=?$

## LESSON 25

### ORAL

1. How many qt. are there in 21 gal.?
2. Change 64 oz. to pounds.
3. 32 qt. of milk were put into pint bottles. How many bottles were used?
4. If a man spends $\frac{3}{4}$ of \$40, how much has he left?
5. A peddler sells 6 qt. and 8 qt. from a bushel of potatoes; how many quarts are left?

### WRITTEN

1. A party starts on an auto trip of $574\frac{8}{10}$ mi. The first day they traveled $129\frac{4}{5}$ mi., the second $150\frac{3}{4}$ mi. How far have they still to go?
2. A peach grower picked on different days: $16\frac{3}{4}$ bu., $17\frac{5}{8}$ bu., $18\frac{1}{2}$ bu., and $19\frac{1}{4}$ bu. How many bushels did he pick in the four days together?
3. A woman bought a bag of flour weighing $24\frac{1}{2}$ lb. She used $13\frac{1}{4}$ lb. for bread and $9\frac{1}{8}$ lb. for cake. How many pounds has she left?
4. A merchant had $98\frac{7}{8}$ yd. in one piece and $48\frac{2}{3}$ yd. in another. He sold $69\frac{1}{8}$ yd. from one piece and $18\frac{1}{4}$ yd. from the other. How many yards were left?
5. How many quarts are there in 65 gal.?
6. A ditch is to be dug 144 yd. long. The first day $\frac{1}{6}$ of it is dug; the second day, $\frac{3}{8}$ of it. How much is left to be dug?
7. A man earned \$72 a month. He spent $\frac{2}{3}$ of it for food and clothing and a fourth of it for rent. How much had he left?
8. Add 104,655; 90,584; 98,198; 300,003; 2987; 14,069; 86,600; 100,000; 14,400; and 98.
9. How many pint bottles can be filled from a 10-gal. cask?
10. Sixty-four 2-oz. packages of spices will weigh how many pounds?

## TYPE XII

### SUBTRACTION OF A MIXED NUMBER FROM A WHOLE NUMBER

1. Take $2\frac{2}{3}$ from 8.

$$\begin{array}{r|r} 7 & \\ \not{8} & 1=\frac{3}{3} \\ -2\frac{2}{3} & -\frac{2}{3} \\ \hline 5\frac{1}{3} & \frac{1}{3} \end{array}$$

(*a*) There is no fraction from which to take $\frac{2}{3}$, therefore take 1 from the whole number, 8, leaving 7. That 1 equals $\frac{3}{3}$.

(*b*) Subtracting the fraction $\frac{2}{3}$ from the fraction $\frac{3}{3}$ leaves $\frac{1}{3}$.

(*c*) Subtracting the whole number 2 from 7, leaves 5.

2. $5-3\frac{3}{4}=?$

3. $12-9\frac{2}{7}=?$

4. $8-3\frac{7}{8}=?$

5. Henry swam 48 ft., William $36\frac{5}{6}$ ft. How many more feet did Henry swim than William?

6. Find the difference between 18 and $12\frac{11}{13}$.

7. A man had \$50. He spent $\$34\frac{3}{4}$. How much had he left?

8. A farmer raised 135 bu. of potatoes. $19\frac{3}{8}$ bu. were bad. How many bushels were good?

9. A carpenter bought 105 ft. of moulding. He sold $72\frac{3}{5}$ ft. How many feet were left?

10. A train had 100 mi. to go. After going $50\frac{2}{7}$ mi., how many miles was it from the end of the trip?

## LESSON 26

### ORAL

1. The subtrahend is 36, the remainder is 15. What is the minuend?

2. If a number is divided by 16, the quotient is 6. What is the dividend?

3. Reduce $\frac{48}{60}$ to lowest terms.

4. How many feet are there in one mile?

5. $2 \times 21 = ?$

### WRITTEN

1. Mr. Smith planted 100 acres of corn and $46\frac{4}{5}$ acres of wheat. How many more acres of corn had he than wheat?

2. From a piece of goods containing 40 yd. there are cut $4\frac{3}{4}$ yd. How many yards are left?

3. A pole 18 ft. long was broken off $12\frac{1}{8}$ ft. from the top. How long is the pole now?

4. Last year John weighed $79\frac{1}{4}$ lb. This year he weighs 83 lb. How many pounds has he gained?

5. A man's income is \$85 per month. He spends $\$24\frac{1}{2}$ for rent and $\$55\frac{3}{4}$ for other expenses. How much does he save?

6. What will 9 tons of coal cost at \$6.75 a ton?

7. The subtrahend is 4365, the remainder is 3264; what is the minuend?

8. What is the dividend when the divisor is 48 and the quotient 79?

9. Reduce $\frac{144}{240}$ to lowest terms.

10. How many feet are there in 5 mi.?

## LESSON 27

### ORAL

1. How many bushels are there in 64 qt.?
2. Find $\frac{7}{11}$ of 99.
3. What is left when the sum of 11 and 36 is taken from 74.
4. $3 \times 21 = ?$
5. How many 17's are there in 34?

### WRITTEN

1. A traveler had 75 miles to go. He has gone $32\frac{1}{4}$ mi. How many more miles has he to go?
2. Last year a man weighed 150 lb.; this year he weighs $132\frac{3}{10}$ lb. How much has he lost in weight?
3. I had 73 yd. of ribbon. I used $31\frac{3}{5}$ yd. How many yards have I left?
4. A pole 15 ft. long was broken in two pieces, one of which is $6\frac{5}{8}$ ft. long. How long is the other?
5. A man sold 3 lots containing 10 acres in all. The first containing $2\frac{2}{3}$ acres, the second $3\frac{3}{4}$ acres. How many acres were there in the third?
6. A tailor bought $42\frac{1}{6}$ yd. of cloth, $39\frac{5}{8}$ yd. of lace, and $54\frac{2}{3}$ yd. of satin. How many yards were bought altogether?
7. Find the cost of 1024 qt. of seed at $2.07 per bushel.
8. Add $9\frac{5}{8}$; $7\frac{1}{2}$; $8\frac{4}{7}$; $4\frac{2}{3}$.
9. $7396 \div 86 = ?$
10. A baseball team plays 154 games during a season. If it wins $\frac{7}{11}$ of the games played, how many games does it lose?

## LESSON 28

### ORAL

*Teach Roman Numbers D to DCC*

1. Take 14 from $20\frac{3}{4}$.
2. What number is represented by DC?
3. How many pints are there in 2 gal.?
4. What will a dozen pineapples cost at 12¢ each?
5. What is the cost of 2 lb. of meat when 3 lb. cost 48¢?

### WRITTEN

DIRECTION: *The teacher will show that where no fraction occurs in the subtrahend the fraction of the minuend is brought down and the whole numbers are then subtracted.*

1. A tailor bought $150\frac{3}{5}$ yd. of cloth. He sold 39 yd. How many yards had he left?

2. A tub of butter weighs $50\frac{4}{5}$ lb. The tub weighs 6 lb. What is the weight of the butter?

3. Mr. Brown weighs 210 lb. Mrs. Brown weighs $194\frac{5}{8}$ lb. How much more does Mr. B. weigh?

4. If 7 articles cost $154, how many can I buy for $462?

5. Write in Roman numerals: 609, 638, 673, 452.

6. A farm yielded 140 bu. of grain; $136\frac{2}{5}$ bu. were sold. How many bushels were left?

7. A dealer had $51\frac{7}{8}$ yd. of silk. He sold $24\frac{1}{8}$ yd. at one time and $17\frac{1}{3}$ yd. at another time. How many yards had he left?

8. What Arabic numbers correspond to DCXLIX, DCLXXXV, DCXCIII?

9. At 9¢ a package, what will 3 doz. packages of rolled oats cost?

10. Alcohol sells for 40¢ a pint. How much does the druggist get for 5 gal.?

## REVIEW VII

1. A farmer has $2\frac{7}{8}$ acres of wheat, $4\frac{3}{4}$ acres of oats, and $7\frac{5}{12}$ acres of corn. How many acres of grain has he?

2. I have a piece of lumber 42 in. long. I wish a piece $37\frac{3}{8}$ in. long. How much must I cut off?

3. I bought N. Y. C. shares at \$98 each. I sold them at $\$99\frac{5}{8}$ each. How much did I gain?

4. One stock was quoted last year at $\$151\frac{7}{8}$ a share. This year it is at $\$137\frac{1}{4}$ a share. How much less is it worth this year?

5. A dealer had in stock $61\frac{11}{12}$ yd. of carpeting. He has sold $13\frac{1}{8}$ yd., $17\frac{1}{2}$ yd., and $9\frac{1}{6}$ yd. How many yards has he left?

6. A woman had \$75. She spent $\frac{2}{5}$ of it for a dress, $\frac{1}{3}$ of it for a hat, and 50¢ for carfare. How much had she left?

7. $15{,}000 \div 87 = ?$

8. A grocer has 8 gal. of syrup. If he sells $\frac{1}{2}$ of it in quart cans at 35¢ a can and the rest in pint cans at 20¢ a can, what will he receive for all?

9. A druggist put up 3 lb. of powder into 4-oz. packages, which he sold at 15¢ each. How much did he receive for all of it?

10. A fruit dealer paid \$14.40 for 6 boxes of oranges last week. This week he bought 9 boxes at the same price per box. What did his oranges cost him this week?

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills, in the time allowed. Write for 5 minutes. Start and stop at the teacher's signal. Score 5 for each correct answer. Keep results and compare with results of successive trials. Note improvement in* **speed** *and* **accuracy.**

| *A* | *B* | *C* | *D* |
|---|---|---|---|
| $\frac{1}{2}$ of 72 = ? | 70 ÷ 35 = ? | 2)60 | $\frac{1}{2}$ of ? = 42 |
| 3 × ? = 51 | 38 × 2 = ? | ? | ? × 2 = 62 |
| 2)82 | $\frac{1}{2}$ of ? = 46 | ? ÷ 30 = 2 | ? ÷ 37 = 2 |
| ? | 40 ÷ ? = 2 | 2) ? | ?)58 |
| $\frac{1}{40}$ of 80 = ? | 2 × ? = 96 | 28 | 2 |
| 20)? | 27)54 | $\frac{1}{2}$ of ? = 33 | ? ÷ 3 = 24 |
| 3 | ? | 56 ÷ ? = 2 | ?)72 |
| ? × 39 = 78 | 44 × ? = 88 | ? ÷ 3 = 19 | 36 |
| $\frac{1}{2}$ of ? = 50 | 2) ? | $\frac{1}{2}$ of 90 = ? | $\frac{1}{3}$ of 57 = ? |
| ? ÷ 34 = 2 | 35 | 42)84 | 29 × 2 = ? |
| 49 × 2 = ? | 66 ÷ 2 = ? | ? | 80 ÷ ? = 2 |
| 64 ÷ 2 = ? | 49)98 | $\frac{1}{28}$ of 56 = ? | $\frac{1}{2}$ of ? = 33 |
| 2 × ? = 68 | ? | 44)? | $\frac{1}{2}$ of 82 = ? |
| | 47 × ? = 94 | 2 | |

## RAPID FACTOR DRILL—*Continued*

| *A* | *B* | *C* | *D* |
|---|---|---|---|
| $54 \div ? = 18$ | $52 \div 26 = ?$ | $? \div 3 = 17$ | $35 \times ? = 70$ |
| $37 \times ? = 74$ | $82 \div ? = 41$ | $30 \times ? = 60$ | $?)\overline{86}$ $\quad 43$ |
| $50)\overline{?}$ $\quad 2$ | $2)\overline{?}$ $\quad 45$ | $18)\overline{54}$ $\quad ?$ | $88 \div 44 = ?$ |
| $72 \div ? = 36$ | $2)\overline{76}$ $\quad ?$ | $? \times 26 = 52$ | $?)\overline{57}$ $\quad 19$ |
| $2)\overline{92}$ $\quad ?$ | $\frac{1}{2}$ of $64 = ?$ | $? \div 2 = 43$ | $31)\overline{62}$ $\quad ?$ |
| $? \div 2 = 39$ | $98 \div 2 = ?$ | $74 \div 37 = ?$ | $39)\overline{?}$ $\quad 2$ |
| $47)\overline{94}$ $\quad ?$ | $\frac{1}{20}$ of $? = 3$ | $\frac{1}{18}$ of $54 = ?$ | $? \div 2 = 48$ |
| $? \div 2 = 29$ | $? \times 2 = 90$ | $75 \div 25 = ?$ | $?)\overline{51}$ $\quad 3$ |
| $\frac{1}{3}$ of $54 = ?$ | $78 \div 3 = ?$ | $?)\overline{52}$ $\quad 2$ | $54 \div ? = 2$ |
| $94 \div ? = 47$ | $60 \div ? = 3$ | $2)\overline{96}$ $\quad ?$ | |

## TYPE XIII

### REDUCTION OF A MIXED NUMBER TO AN IMPROPER FRACTION

1. How many half dollars are there in one dollar?
How many quarters in two dollars?
How many thirds in 1? in 2? in 5?

If you change \$3 in bills for $\frac{1}{2}$ dollars, how many do you get? How many quarters are there in \$4?

2. How many eighths in 2? in 5?

Since there are 8 eighths in 1, in 2 there are 2 times 8 eighths, which is 16 eighths, or $\frac{16}{8}$.

3. How many 9ths in $3\frac{1}{9}$?

In 1 there are 9 ninths; in 3 there are 3 times 9 ninths = 27 ninths. 27 ninths + 1 ninth = 28 ninths, or $\frac{28}{9}$.

4. Reduce $7\frac{3}{4}$ to fourths.

(*a*) 7 times 4 fourths = 28 fourths.

(*b*) 28 fourths + 3 fourths = 31 fourths, or $\frac{31}{4}$.

5. Change $5\frac{2}{7}$ to an improper fraction.

RULE: *To change a mixed number to an improper fraction, multiply the whole number by the denominator of the fraction and add the numerator of the fraction to the product.*

6. Reduce $9\frac{5}{8}$ to 8ths.

7. Change $4\frac{8}{21}$ to 21sts.

8. Change $3\frac{5}{8}$ to an improper fraction.

9. Reduce to fractional form $4\frac{7}{9}$, $9\frac{3}{4}$, $82\frac{5}{11}$, $16\frac{24}{31}$.

## LESSON 29

### ORAL

1. How many thirds are there in $3\frac{1}{3}$?
2. $6 - 2\frac{1}{2} = ?$
3. How many rods are there in one mile?
4. What is the cost of 2 packages of oatmeal @ \$.09 and 3 lb. of rice @ 7¢?
5. $17 \times 3 = ?$

### WRITTEN

1. (*a*) Change $9\frac{1}{4}$ to an improper fraction. (*b*) Change $3\frac{3}{8}$ to an improper fraction. (*c*) Change $2\frac{4}{5}$ to an improper fraction.
2. How many eighths are there in $6\frac{5}{8}$?
3. How many twelfths are there in $6\frac{5}{12}$?
4. Add three hundred two; six thousand seven hundred eight; twenty-four thousand five hundred twenty-six; forty-three; seven.
5. Subtract $100\frac{1}{3}$ from 200.
6. Write the Roman numerals for 239, 456, 599, 694.
7. Write in words 40,009; 62,007; 400,800; 20,001.
8. Add 302,641; 98,024; 226,497; 9654; 73,496.
9. Mrs. Weiss bought at a grocer's 2 lb. butter @ 32¢, 10 lb. sugar @ 6¢, 3 pkg. raisins @ 13¢, 2 bags flour @ 75¢. What was the amount of her bill?
10. At 60¢ a rod, what will a half-mile of fence cost?

## LESSON 30

### ORAL

1. How many halves are there in $6\frac{1}{2}$?

2. The quotient is 3; the divisor is 18. What is the dividend?

3. If you spell $\frac{11}{12}$ of 48 words correctly, how many do you have wrong?

4. If your bill for eggs and sugar is 90¢, and the eggs cost 64¢, what does the sugar cost?

5. $17 \times 5 = ?$

### WRITTEN

1. Change $6\frac{2}{3}$ to an improper fraction.

2. Change $6\frac{3}{14}$ to an improper fraction.

3. Change $12\frac{4}{5}$ to an improper fraction.

4. Change $8\frac{4}{7}$ to sevenths.

5. Change $13\frac{5}{9}$ to a fraction having 9 for its denominator.

6. The quotient is 207; the divisor is 365. Find the dividend.

7. There are 576 tulips in a flower bed in the park. $\frac{4}{9}$ of them are red; the rest are yellow. How many yellow tulips are there?

8. I had $492. I lost $\frac{5}{6}$ of it. How much had I left?

9. Of 720 boats in a navy, $\frac{2}{3}$ are battleships, $\frac{1}{4}$ are cruisers, $\frac{1}{3}$ are torpedo boats, and the remainder are submarines. How many submarines are there?

10. A contractor agreed to build a house for $9850. The bills were: labor, $4200; lumber, $2375; brick and stone, $840; cement and sand, $109; hardware, $324; painting, $475. How much did the contractor make on the contract?

## TYPE XIV

### SUBTRACTION OF MIXED NUMBERS, THE FRACTION IN THE MINUEND BEING SMALLER THAN THE FRACTION IN THE SUBTRAHEND

1. From $29\frac{1}{4}$ take $15\frac{3}{8}$.

| | | $1 = \frac{8}{8}$ |
|---|---|---|
| | | $+\frac{2}{8}$ |
| 28 | | |
| $\cancel{29}\,\cancel{1}\frac{1}{4}$ | $\frac{2}{8}$ | $\frac{10}{8}$ |
| $15\frac{3}{8}$ | $\frac{3}{8}$ | $-\frac{3}{8}$ |
| $13\frac{7}{8}$ | | $\frac{7}{8}$ |

(*a*) Change the fractions to a common denominator.

(*b*) Since the fraction $\frac{2}{8}$ in the minuend is smaller than the fraction $\frac{3}{8}$ in the subtrahend, take 1 from the whole number 29, leaving 28. That 1 equals $\frac{8}{8}$.

(*c*) Adding the $\frac{2}{8}$ in the minuend to $\frac{8}{8}$ gives $\frac{10}{8}$. Subtracting $\frac{3}{8}$ in the subtrahend from $\frac{10}{8}$ leaves $\frac{7}{8}$.

(*d*) Subtracting the whole number 15 from 28 leaves 13. The whole answer is $13\frac{7}{8}$.

2. Subtract $1\frac{2}{3}$ from $3\frac{1}{4}$.
3. $7\frac{1}{5} - 3\frac{7}{10} = ?$
4. $12\frac{17}{24} - 9\frac{7}{8} = ?$
5. From $9\frac{3}{11}$ take $3\frac{9}{33}$.
6. Subtract $1\frac{2}{3}$ from $3\frac{1}{6}$.
7. From $16\frac{1}{6}$ take $5\frac{5}{12}$.

## LESSON 31

### ORAL

1. $22 \times 2 = ?$

2. How many 21's are there in 63?

3. $62 - 38 = ?$

4. A furniture dealer sells a chair for \$28. If $\frac{5}{14}$ of this is profit, what is the profit?

5. If 14 papers of pins cost \$.70, what would 20 papers of pins cost?

### WRITTEN

1. Yesterday a grain dealer had $968\frac{3}{4}$ bu. of oats in his elevator. To-day he has $1000\frac{1}{4}$ bu. How many more has he to-day than yesterday?

2. From $97\frac{1}{2}$ subtract $88\frac{3}{4}$.

3. Mr. Smith's bees produced $489\frac{7}{16}$ lb. of honey. He sold $236\frac{3}{4}$ lb. How many pounds remained?

4. A farmer raised $100\frac{1}{8}$ bu. of wheat. He sold $28\frac{5}{8}$ bu. to me and $53\frac{3}{4}$ bu. to another. How many bushels had he left?

5. A dry-goods merchant had $68\frac{1}{2}$ yd. of muslin. He sold $43\frac{3}{4}$ yd. and $18\frac{5}{8}$ yd. How many yards had he left?

6. A farm covered 75 A. originally, but two fields of $25\frac{3}{4}$ A. and $18\frac{3}{5}$ A. have been sold from it. How large is the farm now?

7. A woman bought $9\frac{7}{8}$ yd. of silk, $12\frac{7}{10}$ yd. of lining, $2\frac{3}{4}$ yd. of ribbon, and $3\frac{4}{5}$ yd. of lace. How many yards in all did she purchase?

## LESSON 31—*Continued*

8. A boat builder sold in one year 28 motor boats for $12,600. The next year his sales were $16,650. At the same price, how many boats did he sell the second year?

9. Eleven gas engines sold for $725 each. $\frac{3}{25}$ of this sum was profit. How much was the profit?

10. Add three thousand eight; four million forty thousand four hundred eighty-six; four thousand sixteen; twenty-seven thousand nine hundred; four hundred thousand four hundred; two million two hundred seven thousand seven hundred.

## LESSON 32

### ORAL

1. How many quarts are there in 18 gal.?
2. Find $\frac{2}{7}$ of 84.
3. $66 \div 3 = ?$
4. Take the sum of 8 and 9 from 40.
5. $3\frac{3}{4} + 2\frac{3}{4} = ?$

### WRITTEN

1. It is $12\frac{1}{2}$ mi. from my house to my office. If I ride $1\frac{1}{4}$ mi. on a trolley and $10\frac{5}{8}$ mi. on the railroad, how many miles have I to walk to get to my office?

2. Add $8\frac{1}{2}$ and $2\frac{7}{8}$. Subtract the sum from $15\frac{1}{4}$.

3. A farmer raised $308\frac{1}{3}$ bu. of corn. He sold $147\frac{7}{8}$ bu. and $63\frac{3}{4}$ bu. How many bushels were left?

4. In a tank there were $408\frac{1}{10}$ gal. of water; $298\frac{3}{4}$ gal. were used. How many gallons remained?

5. (*a*) Reduce 42 gal. to quarts. (*b*) Change the answer to pints.

6. Add sixty thousand six; seven hundred eighty-four thousand ninety-four; thirty-six thousand sixteen; eighty-nine; four thousand four; eight hundred eighty thousand; eight hundred eight; nine thousand six hundred forty-eight.

7. A clerk sold at successive sales $18\frac{7}{8}$ yd., $14\frac{5}{6}$ yd., $17\frac{2}{3}$ yd., and $27\frac{1}{2}$ yd. What were his total sales?

8. Divide 5104 by 44. Multiply the quotient by 107.

9. A boy has ridden on 4 trips $16\frac{1}{2}$ mi., $18\frac{2}{5}$ mi., $27\frac{5}{12}$ mi., and $19\frac{2}{3}$ mi. How many miles has he ridden in all?

10. Find $\frac{3}{7}$ of 161.

## REVIEW VIII

1. Change to improper fractions $16\frac{7}{8}$, $33\frac{1}{3}$, $2\frac{13}{16}$, $5\frac{6}{7}$.

2. Add $23\frac{1}{2}$, $57\frac{5}{8}$, and $16\frac{4}{5}$.

3. Subtract $14\frac{7}{10}$ from $22\frac{1}{8}$.

4. In a western town containing 3240 people, $\frac{3}{4}$ are whites, $\frac{1}{15}$ are negroes, $\frac{1}{6}$ are Chinese, and the remainder are Indians. How many are there of each?

5. In an army of 186,900 men, $\frac{1}{42}$ were killed and $\frac{1}{7}$ were wounded. How many were killed and how many were wounded?

6. A merchant bought produce for \$317.50. He paid \$16.83 freight, and \$7.50 cartage. He sold the produce for \$412.45. What was the total cost? How much did he gain?

7. At \$.08 a quart, what is the cost of 9 gal. of milk?

8. A butcher had $25\frac{1}{2}$ lb. of meat. He sold $3\frac{1}{2}$ lb., $2\frac{5}{8}$ lb., and $4\frac{3}{4}$ lb. How many pounds had he left?

9. It cost the Board of Education \$40.05 for 45 geographies. What will 56 copies cost at a price 2¢ cheaper?

10. It is $234\frac{3}{10}$ mi. from here to X. Mr. Smith lives $18\frac{1}{2}$ mi. this side of X. How far is it from here to Mr. Smith's place?

## MULTIPLICATION DRILL

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| 3,759,742 | 97,867 | 3645 | 4657 | 3486 | 8756 |
| ×6 | ×29 | ×456 | ×347 | ×427 | ×452 |
| 5,873,945 | 48,576 | 8251 | 3576 | 4386 | 8795 |
| ×8 | ×48 | ×546 | ×457 | ×327 | ×763 |
| 4,637,583 | 59,786 | 6235 | 3274 | 5497 | 8795 |
| ×5 | ×27 | ×645 | ×742 | ×264 | ×346 |
| 6,497,832 | 96,875 | 5634 | 4375 | 6597 | 9858 |
| ×9 | ×63 | ×625 | ×637 | ×326 | ×256 |
| 1,263,984 | 68,794 | 2634 | 3275 | 7598 | 8795 |
| ×7 | ×59 | ×436 | ×736 | ×437 | ×754 |
| 6,398,473 | 86,597 | 6352 | 7465 | 7698 | 8956 |
| ×4 | ×78 | ×524 | ×765 | ×437 | ×634 |
| 51,978,678 | 93,827 | 6564 | 6741 | 5487 | 4987 |
| ×9 | ×93 | ×563 | ×706 | ×547 | ×547 |
| 2,199,867 | 39,284 | 6021 | 6075 | 6584 | 4857 |
| ×8 | ×85 | ×506 | ×647 | ×527 | ×374 |

## MULTIPLICATION DRILL—*Continued*

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| 5,798,685 | 83,729 | 5614 | 4376 | 9076 | 4897 |
| ×7 | ×79 | ×632 | ×746 | ×427 | ×674 |
| 6,168,794 | 63,528 | 5236 | 4372 | 8796 | 4986 |
| ×6 | ×64 | ×416 | ×475 | ×537 | ×273 |
| 9,291,987 | 93,725 | 5432 | 3276 | 7859 | 5986 |
| ×5 | ×49 | ×146 | ×175 | ×457 | ×546 |

## LESSON 33

*Teach the Roman Numbers DCC to DCCC*

### ORAL

1. The difference between two numbers is 28. The greater number is 65. What is the smaller number?
2. If you spend $\frac{3}{5}$ of 30¢, how much money have you left?
3. A boy can work 5 problems in 10 min. At the same rate how many problems can he work in 30 min.?
4. $18 \times 2 = ?$
5. How many 3's are there in 51?

### WRITTEN

1. Subtract the sum of $23\frac{7}{8}$ and $19\frac{5}{8}$ from 50.
2. The greater of two numbers is $127\frac{4}{45}$. The difference is $52\frac{7}{9}$. Find the smaller.
3. Subtract $8\frac{5}{9}$ from $10\frac{5}{6}$.
4. A pole $16\frac{5}{16}$ ft. long was cut into two pieces, one measuring $8\frac{3}{4}$ ft. How long was the other piece?
5. A train traveled $16\frac{1}{3}$ mi. with 4 stops. On the first run, it made $4\frac{5}{6}$ mi.; then it ran $5\frac{3}{4}$ mi. before a stop was made; and then $3\frac{1}{8}$ mi. to the next stop. How long was the last run?
6. The value of 98 Turkish rugs is \$2744. How many rugs can be bought for \$2856 at the same average price?
7. Having \$56, I spent $\frac{1}{8}$ of it and $\frac{1}{4}$ of it. How much had I left?
8. If the subtrahend is $409\frac{8}{11}$ and the difference is $160\frac{1}{8}$, what is the minuend?
9. Write in Roman numerals 706, 737, 770, 644, 521.
10. A man had \$42. He spent $\frac{1}{2}$ and $\frac{1}{7}$ of it. How much had he left?

## LESSON 34

### ORAL

1. How much sugar at 6¢ a pound is worth as much as 4 lb. of cheese at 24¢ a pound?
2. How many rods are there in $\frac{1}{4}$ of a mile?
3. What will a half dozen combs cost at 15¢ each?
4. $18 \times 5 = ?$
5. $68 \div 17 = ?$

### WRITTEN

1. A farmer raised $300\frac{1}{5}$ bu. of corn. He sold $96\frac{3}{5}$ bu. to one man and $49\frac{3}{4}$ bu. to another. How many bushels had he left?
2. From $98\frac{1}{4}$ subtract $89\frac{9}{20}$.
3. Add $3\frac{3}{11}$ and $8\frac{1}{2}$. Subtract the sum from $17\frac{9}{22}$.
4. A. worked 10 days at $2.25 a day. It took B. only 9 days to earn the same amount. How much did B. receive per day?
5. Change $68\frac{3}{4}$ and $17\frac{9}{10}$ to improper fractions.
6. A child bought groceries amounting to $1.48. She gave the clerk $2 and received 50¢ change. Find the error in change.
7. A railroad train ran 160 rods in a minute. In what time will it run 9 miles at that rate?
8. Roses are 5¢ each. Find the cost of 16 dozen.
9. Find the cost of 8 bolts of ribbon each containing 25 yd. at 49¢ per yard.
10. I bought a house for $3500 and spent $247.50 for repairs. I sold it at a loss of $98.75. For what did I sell it?

## LESSON 35

### ORAL

1. $3\frac{2}{3}+4\frac{2}{3}=?$
2. After spending $\frac{1}{2}$ of 50¢ and 10¢ more, how much money is left of the half dollar?
3. If 7 bbl. of apples cost $28, what will 10 bbl. cost at the same rate?
4. $19\times2=?$
5. How many 17's are there in 68?

### WRITTEN

1. What is the difference between $607\frac{7}{8}$ and $499\frac{3}{5}$?
2. A farmer had $89\frac{3}{4}$ acres under cultivation. Now he has $102\frac{7}{8}$ acres. How much has he increased his acreage?
3. An engineer usually earns $\$125\frac{3}{4}$. Last month he earned only $\$89\frac{7}{10}$. How much less did he earn last month than usual?
4. I bought $7\frac{1}{2}$ lb. of sugar and used $5\frac{7}{8}$ lb. How many pounds had I left?
5. A dealer bought $327\frac{7}{8}$ yd. of silk. He sold $289\frac{2}{3}$ yd. How many yards had he left?
6. Add three thousand four; twenty-seven thousand six hundred; one hundred ninety thousand nine; two hundred thousand two; four thousand eighty-six; five hundred ten thousand fifty-five; two thousand nine hundred.
7. Add $27\frac{1}{3}$, $18\frac{1}{3}$, $16\frac{5}{6}$, and $14\frac{1}{2}$.
8. I had $2400 in the bank. I drew out $\frac{2}{3}$ of it at one time and $310.75 at another time. How much remained in the bank?
9. A merchant purchased at different times $26\frac{1}{8}$ yd., $17\frac{1}{4}$ yd., $18\frac{1}{2}$ yd., and 16 yd. What was the total number of yards?
10. An army agent bought 64 mules for $15,488. He was offered 108 more at the same price and took them. How much did he pay altogether?

## LESSON 36

### ORAL

1. Change $\frac{30}{7}$ to a mixed number.
2. How many eighths are there in $5\frac{3}{8}$?
3. $6\frac{2}{3}+3\frac{1}{3}=?$
4. $19\times2=?$
5. $63\div21=?$

### WRITTEN

1. Change $\frac{388}{9}$ to a mixed number.
2. Change $46\frac{5}{14}$ to an improper fraction.
3. Change $\frac{7683}{24}$ to a mixed number.
4. Reduce $\frac{3965}{36}$ to a mixed number.
5. Change $49\frac{31}{48}$ to an improper fraction.
6. A creamery made $392\frac{1}{8}$ lb. of butter at one time, $139\frac{1}{2}$ lb. at another, and $236\frac{3}{4}$ lb. at another. How many pounds were made in all?
7. Mr. Jones has $36\frac{2}{9}$ acres of corn, $42\frac{1}{7}$ acres of oats, and $34\frac{2}{3}$ acres of hay. How many acres has he in all?
8. If I ride on my wheel $14\frac{1}{2}$ mi. this morning and $19\frac{2}{5}$ mi. this afternoon, and $18\frac{3}{4}$ mi. tomorrow morning, how many miles of a 144 mi. journey will I still have to ride?
9. A bolt of gingham containing 33 yd. was cut into five pieces, one of $9\frac{1}{6}$ yd., one of $3\frac{3}{8}$ yd., one of $6\frac{3}{4}$ yd. and one of $7\frac{1}{2}$ yd. How many yards were there in the fifth piece?
10. Add $27\frac{5}{8}$, $129\frac{3}{16}$, $234\frac{1}{3}$ and $132\frac{5}{12}$.

## REVIEW IX

1. Change to mixed numbers $\frac{135}{8}$, $\frac{115}{6}$, $\frac{151}{4}$, $\frac{89}{3}$.

2. In 235 quarters, how many dollars are there?

3. The water in the river rose 4 in. in one hour, $4\frac{1}{2}$ in. the next hour, $3\frac{5}{8}$ in. the next, and $2\frac{5}{8}$ in. in the next. How many inches did it rise in the four hours?

4. Since last week, when it reached a height of $15\frac{1}{4}$ ft., the river has dropped $6\frac{7}{10}$ ft. How high is it now?

5. A dealer has received 2 carloads of coal weighing $38\frac{9}{10}$ tons and $44\frac{4}{5}$ tons. He had on hand $12\frac{1}{2}$ tons. He sold to-day $49\frac{3}{4}$ tons. How many tons has he on hand now?

6. 17 cars were used to carry 1326 people. How many cars are needed for 2106 people?

7. A man's income is \$1680 a year. He spends $\frac{1}{5}$ of it for rent and $\frac{1}{4}$ of it for food. How much per month does he spend for each?

8. Change to improper fractions $24\frac{1}{2}$, $87\frac{1}{3}$, $19\frac{4}{5}$, $31\frac{1}{4}$.

9. The north side of a park is 2 mi. long. The east side is $\frac{1}{2}$ of a mile long. How many rods is it around the north and east sides?

10. What is the cost of 20 crates of berries each containing 32 boxes at 9¢ a box?

## DIVISION DRILL

### *A*

1. 123)421,398
2. 352)863,456
3. 421)1,538,334
4. 513)1,874,502
5. 217)769,482
6. 145)935,685
7. 241)591,173
8. 436)1,362,064
9. 621)1,325,214
10. 264)904,200
11. 354)939,162
12. 357)880,005
13. 353)1,487,189
14. 512)1,247,232

### *B*

1. 126)446,796
2. 315)1,370,880
3. 457)1,491,648
4. 542)896,468
5. 425)1,505,350
6. 116)411,336
7. 215)1,383,525
8. 412)1,505,448
9. 632)1,609,072
10. 256)1,444,608
11. 135)737,505
12. 263)1,114,068
13. 351)1,496,313
14. 523)2,386,449

### *C*

1. 237)1,337,391
2. 427)1,094,828
3. 251)1,163,385
4. 362)1,525,106
5. 431)1,535,222
6. 146)520,344
7. 452)1,430,580
8. 643)1,693,662
9. 347)570,121
10. 631)2,936,043
11. 524)1,898,976
12. 413)2,666,328
13. 723)1,761,228
14. 914)5,807,556

### *D*

1. 562)1,425,232
2. 316)1,786,664
3. 136)632,808
4. 614)3,464,802
5. 732)2,673,264
6. 923)3,289,572
7. 218)1,014,354
8. 451)1,625,855
9. 613)3,104,232
10. 532)1,736,448
11. 741)1,224,873
12. 932)4,319,820
13. 437)1,514,205
14. 153)524,178

## REVIEW C

1. Add 38,169; 215,976; 59,547; 165,854; 5815; 109,747.

2. Find the difference between six hundred twenty thousand fifteen, and fifty-eight thousand seven hundred seven.

3. An importer brought into this country 275 fox skins valued at $14.75 each. What did they all cost?

4. He had to pay at the port of entry a tax of $\frac{1}{5}$ of the value. How much tax did he pay?

5. Divide 535,806 by 927.

6. A grain dealer received to-day as follows: $539\frac{1}{2}$ bu., $487\frac{3}{4}$ bu., $473\frac{5}{8}$ bu., $563\frac{2}{3}$ bu. What were his total receipts?

7. My house lot is $119\frac{1}{3}$ ft. wide. If I sell my neighbor a strip $5\frac{3}{4}$ ft. wide, what will be the width of my lot then?

8. I have a piece of wood 42 in. long. If I cut 3 pieces from it, measuring $10\frac{1}{2}$ in., $12\frac{3}{8}$ in., and $18\frac{3}{4}$ in., how much will be left?

9. Write in Roman numerals 47, 194, 209, 538.

10. A boy worked 9 days at 15¢ a day. He spent $\frac{1}{5}$ of the money for marbles at 2 for 1 ¢. How many marbles did he buy?

11. Add twenty-thousand seven; two hundred nine thousand ninety; eight thousand six hundred one; fifteen thousand two; one thousand eight hundred.

## REVIEW C—*Continued*

12. The receipts from a football game were \$19,042.16. The expenses were \$9485.79. What were the net receipts?

13. Multiply 859 by 476.

14. A sailing vessel made a trip of 13,483 mi. to San Francisco. At the rate of 139 mi. per day, how many days did it take?

15. A falling body falls $16\frac{1}{12}$ ft. the first second, $48\frac{1}{4}$ ft. the second, and $80\frac{5}{12}$ ft. the third. How far does it fall in the first three seconds?

16. One tree is $50\frac{3}{8}$ ft. tall; another is $48\frac{3}{4}$ ft. What is the difference in the height of the two trees?

17. It is 143 mi. from New York to Albany. If it is $40\frac{1}{2}$ mi. from New York to Peekskill and $33\frac{5}{8}$ mi. more to Poughkeepsie, how many miles is it from Poughkeepsie to Albany?

18. A train ran 88 ft. a second. At that rate how many miles will it run in a minute?

19. I paid \$2.52 for 3 doz. Japanese lanterns. Find the cost of each.

20. A man bought a house costing \$4500. He paid $\frac{1}{4}$ of the cost the first year, $\frac{1}{5}$ the next year, $\frac{1}{3}$ the next, and the balance the fourth year. How much did he pay the last year?

21. $7694+3857+1729-5897=?$

22. The cost of maintaining the various departments of a city was \$756,000. Of this sum, $\frac{2}{5}$ was for schools,

## REVIEW C—*Continued*

$\frac{1}{4}$ for streets, and $\frac{1}{10}$ for fire protection. Find the amount needed for each department mentioned.

23. A dealer imported 40,000 cigars. They cost him 4¢ each. The government tax amounted to $300. He sold them at 8¢ each. Find his gain.

24. A firm used 828,360 lb. of cotton in 312 days. What was the average amount used per day?

25. Write in words 201,007.

26. The receipts for 29 days were $8631.27. At that rate, what will they amount to in 89 days?

27. A tub of butter weighs $31\frac{1}{8}$ lb. The tub alone weighs $2\frac{1}{2}$ lb. What is the weight of the butter?

28. A barrel of flour weighs 196 lb. What is half a barrel of flour worth at 4¢ a pound?

29. A bag of flour is $\frac{1}{8}$ of a barrel. If a barrel sells for $6.80, what is the value of a bag?

30. In a certain district, a company collected 5875 qt. of milk. How many 10-gallon cans can be filled and how much will remain?

31. I bought soap for 55¢, a broom for 35¢, pails for 80¢, brushes for 48¢ and ammonia for 25¢. What change should I receive from $5?

32. The divisor is 386; the quotient is 579. Find the dividend.

33. The sum of two numbers is $17\frac{3}{7}$. One number is $8\frac{5}{7}$. What is the other?

## REVIEW C—*Continued*

34. Subtrahend, $57\frac{4}{5}$; remainder, $68\frac{2}{5}$. Find the minuend.

35. The greater of two numbers is $13\frac{7}{10}$. The sum of the two is $21\frac{5}{12}$. What is the lesser number?

36. A person can read 12 pages an hour. How long will it take him to read a book of 912 pages, if he reads 4 hr. a day?

37. A clock ticks every second. How many times does it tick every hour? How many times does it tick in a day?

38. If a man smokes 2 cigars a day, how much will his tobacco cost him for April, if he pays 25¢ for each 3 cigars?

39. A commission merchant received 500 bu. of apples. He put them into baskets holding 2 pk. each and sold them at 25¢ a basket. How much did he receive?

40. The distance around two sides of a field is 712 ft. If the field is 267 ft. wide, how long is it?

41. A man bought 149 acres of land for $7599 and sold it at $65 an acre. How much did he gain?

42. A dealer sold 48 bu. of potatoes for $36.48. At what price were they sold?

43. A miller sold flour for $2423 and gained $436.72. Would he have gained or lost and how much if he had sold it for $2000?

44. A man having a farm of 121 acres sold $38\frac{3}{8}$ acres. How many acres had he left?

## REVIEW C—*Continued*

45. A coal dealer has received 5 carloads containing $42\frac{3}{4}$ tons, $45\frac{1}{2}$ tons, $39\frac{7}{10}$ tons, $38\frac{4}{5}$ tons, and $41\frac{5}{8}$ tons. How many tons has he received?

46. Change $123\frac{11}{16}$ to an improper fraction.

47. Change $\frac{9}{11}$ to a fraction with 44 for the denominator.

48. Subtrahend, $6\frac{7}{8}$; difference, $13\frac{9}{10}$. Find the minuend.

49. From the sum of $6\frac{2}{3}$ and $19\frac{5}{6}$ take the sum of $12\frac{7}{8}$ and $5\frac{3}{4}$.

50. The quotient is 795; the divisor is 89. Find the dividend.

## DENOMINATE NUMBER DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Write for 5 minutes. Start and stop on signal. Score 5 for each correct answer. Keep results. Compare with successive trials. Note improvement in* **speed** *and* **accuracy**.

| *A* | *B* | *C* |
|---|---|---|
| 5280 ft. = ? | 320 rd. = ? | 365 da. = ? |
| ? sec. = 1 min. | ? oz. = $\frac{1}{2}$ lb. | 3 ft. = ? |
| 32 qt. = ? | 60 min. = ? | ? pk. = 1 bu. |
| ? qt. = 1 bu. | 12 in. = ? | 1760 yd. = ? |
| 60 sec. = ? | ? oz. = 1 lb. | 1 pk. = ? |
| 7 da. = ? | 4 qt. = ? | 24 hr. = ? |
| 16 oz. = ? | 1 mi. = ? ft. | ? da. = 1 wk. |
| 12 things = ? | 24 hr. = ? | 3 ft. = ? |
| ? yd. = 1 mi. | ? qt. = 1 gal. | 1 yr. = ? mo. |
| 1 hr. = ? min. | 36 in. = ? | 4 oz. = ? |
| 28–31 da. = ? | 1 bu. = ? qt. | 2 pt. = ? |
| 8 oz. = ? | 4 pk. = ? | ? rd. = 1 mi. |
| 8 qt. = ? | | |

*How do you change*

| | | |
|---|---|---|
| qt. to gal.? | lb. to oz.? | ft. to in.? |
| pt. to gi.? | yd. to mi.? | things to doz.? |
| oz. to lb.? | pt. to qt.? | gi. to pt.? |
| in. to ft.? | yd. to in.? | in. to yd.? |
| qt. to pt.? | gal. to qt.? | mi. to rd.? |
| rd. to mi.? | bu. to pk.? | pk. to bu.? |

## FRACTION DRILL II

### Short Method

$\frac{1}{3}+\frac{2}{5}=?$ $\qquad (5\times1)+(3\times2)$

$$\frac{1\diagdown\!\!\diagup 2}{3\diagdown\!\!\diagup 5}=\frac{(5\times1)+(3\times2)}{(3\times5)}=\frac{11}{15}$$

$3\times5$

Rule: *Multiply the numerator of each fraction by the denominator of the other fraction and add the two products for a new numerator. Multiply the denominators for a new denominator.*

$\frac{1}{2}+\frac{2}{3}=?$
$\frac{1}{2}+\frac{3}{4}=?$
$\frac{1}{2}+\frac{4}{5}=?$
$\frac{1}{2}+\frac{3}{5}=?$
$\frac{1}{2}+\frac{2}{5}=?$
$\frac{1}{2}+\frac{5}{6}=?$
$\frac{1}{2}+\frac{6}{7}=?$
$\frac{1}{2}+\frac{5}{7}=?$
$\frac{1}{2}+\frac{7}{8}=?$
$\frac{1}{2}+\frac{5}{8}=?$
$\frac{1}{2}+\frac{3}{8}=?$
$\frac{1}{2}+\frac{7}{9}=?$
$\frac{1}{2}+\frac{8}{9}=?$
$\frac{1}{2}+\frac{9}{10}=?$
$\frac{1}{3}+\frac{3}{4}=?$
$\frac{1}{3}+\frac{4}{5}=?$
$\frac{1}{3}+\frac{3}{5}=?$

$\frac{1}{3}+\frac{2}{5}=?$
$\frac{1}{3}+\frac{5}{6}=?$
$\frac{1}{3}+\frac{6}{7}=?$
$\frac{1}{3}+\frac{7}{8}=?$
$\frac{1}{3}+\frac{5}{8}=?$
$\frac{1}{3}+\frac{3}{8}=?$
$\frac{1}{3}+\frac{8}{9}=?$
$\frac{1}{3}+\frac{7}{9}=?$
$\frac{1}{3}+\frac{5}{9}=?$
$\frac{1}{3}+\frac{9}{10}=?$
$\frac{1}{4}+\frac{4}{5}=?$
$\frac{1}{4}+\frac{3}{5}=?$
$\frac{1}{4}+\frac{2}{5}=?$
$\frac{1}{4}+\frac{5}{6}=?$
$\frac{1}{4}+\frac{6}{7}=?$
$\frac{1}{4}+\frac{7}{8}=?$
$\frac{1}{4}+\frac{5}{8}=?$
$\frac{1}{4}+\frac{3}{8}=?$

$\frac{1}{4}+\frac{8}{9}=?$
$\frac{1}{4}+\frac{9}{10}=?$
$\frac{1}{5}+\frac{5}{6}=?$
$\frac{1}{5}+\frac{6}{7}=?$
$\frac{1}{5}+\frac{7}{8}=?$
$\frac{1}{5}+\frac{7}{9}=?$
$\frac{1}{5}+\frac{8}{9}=?$
$\frac{1}{5}+\frac{9}{10}=?$
$\frac{1}{6}+\frac{6}{7}=?$
$\frac{1}{6}+\frac{7}{8}=?$
$\frac{1}{6}+\frac{8}{9}=?$
$\frac{1}{6}+\frac{9}{10}=?$
$\frac{1}{7}+\frac{8}{9}=?$
$\frac{1}{7}+\frac{9}{10}=?$
$\frac{1}{8}+\frac{8}{9}=?$
$\frac{1}{8}+\frac{9}{10}=?$
$\frac{1}{9}+\frac{9}{10}=?$

## LESSON 37

*Teach the Roman numbers DCCC to CM.*

### ORAL

1. Change $\frac{108}{12}$ to a whole number.
2. $4\frac{1}{2}+1\frac{1}{2}=?$
3. $?-28=36?$
4. $20\times2=?$
5. How many 22's are there in 44?

### WRITTEN

1. Change $\frac{364}{3}$ to a mixed number.
2. $83,706+472,931+200,050+9360+48,927=?$
3. $92,193-46,992=?$ Divide the remainder by 247.
4. $14\frac{3}{5}+37\frac{1}{2}+96\frac{2}{3}+3\frac{3}{4}=?$
5. Change 109 to 16ths.
6. John gathered $19\frac{1}{4}$ bu. of walnuts. He sold $12\frac{7}{8}$ bu. How many bushels had he left?
7. I had $384\frac{7}{16}$ bu. of corn. I used $16\frac{5}{8}$ bu. at one time and $16\frac{5}{8}$ bu. at another. How many bushels had I left?
8. In a 660-yd. medley race, one boy ran $160\frac{1}{2}$ yd., a second ran $125\frac{2}{3}$ yd., and a third $189\frac{1}{4}$ yd. How far did the fourth boy run?
9. From a flag pole, $19\frac{1}{4}$ ft. are cut off. $46\frac{2}{3}$ ft. remained. How long was the pole originally?
10. Write the Roman numerals for 811, 891, 819, 826.

## LESSON 38

### ORAL

1. How many quarter pounds are there in 5 lb.?

2. Take the sum of 20 and 30 from 90.

3. What will 3 yd. of lace cost at \$.19 a yard?

4. At 20¢ each, how many pounds of lard may be bought for one dollar?

5. What number multiplied by 18 will give a product of 36?

### WRITTEN

1. A tailor had 110 yd. of cloth. He used $84\frac{7}{12}$ yd. How many yards had he left?

2. A tub of butter weighed $36\frac{3}{16}$ lb. The butter weighed $31\frac{3}{4}$ lb. How much did the tub weigh?

3. $37{,}422 \div 189 = ?$

4. Add six hundred seven thousand forty-three; nine thousand one hundred eighty; ninety-seven thousand forty-three; forty thousand two; eight thousand eight hundred eight.

5. A grocer wrapped 15 lb. of tea in $\frac{1}{4}$-lb. packages, which he sold at \$.15 each. How much did he get for the tea?

6. Write in words 69,007; 200,072; 444,400.

7. A dealer had $687\frac{3}{5}$ tons of coal. He sold $264\frac{1}{2}$ tons and $179\frac{6}{10}$ tons. How many tons had he left?

8. Add 487,291; 42,866; 147,928; 9878; 94,799.

9. Add eighty-six thousand six; eighty-nine thousand two; five thousand eight; fifty thousand ninety-two; six hundred thousand forty.

10. Write the Roman numerals for 451, 628, 749, 898, 847.

## TYPE XV

*Teach the use of the horizontal line between a dividend and a divisor in problems involving multiplication and division.*

1. Divide $15\times24$ by 12.

(*a*) $15\times24=360$.

(*b*) $360\div12=30$.

This may be expressed in a single operation by writing the dividend ($15\times24$) above a horizontal line and the divisor (12) below the line, thus:

$$\frac{15\times24}{12}.$$

The problem is now expressed in the form of a fraction. The numerator is $15\times24$. The denominator is 12. Since both numerator and denominator of a fraction may be divided by the same number without changing the value of the fraction, we may divide both terms of the fraction

$$\frac{15\times24}{12} \text{ by } 12.$$

$$\frac{15\times\overset{2}{\cancel{24}}}{\underset{1}{\cancel{12}}}=\frac{15\times2}{1}=\frac{30}{1}=30.$$

2. Divide $16\times18$ by $6\times4$.

$$\frac{16\times18}{6\times4}=\frac{\overset{4}{\cancel{16}}\times\overset{3}{\cancel{18}}}{\underset{1}{\cancel{6}}\times\underset{1}{\cancel{4}}}=\frac{4\times3}{1\times1}=\frac{12}{1}=12.$$

By inspection we see that 6 is a factor of 18 in the numerator and 6 in the denominator. 4 is also a factor of 16 and 4.

## TYPE XV—*Continued*

Divide both numerator and denominator by the common factors 6 and 4.

3. $\frac{36\times18}{24}=?$

(*A*) $\frac{\overset{3}{\cancel{36}}\times18}{\underset{2}{\cancel{24}}}=\frac{3\times18}{2}=?$

(*A*) By inspection we see that 12 is a common factor of both 36 and 24. Divide both terms by 12.

(*B*) $\frac{3\times\overset{9}{\cancel{18}}}{\underset{1}{\cancel{2}}}=\frac{3\times9}{1}=\frac{27}{1}=27.$

(*B*) 2 is a common factor of 18 and 2. Divide both terms by 2.

(*A*) and (*B*) may be expressed in one operation

$$\frac{\overset{3}{\cancel{36}}\times\overset{9}{\cancel{18}}}{\underset{1}{\cancel{24}}}=\frac{3\times9}{1}=27.$$

4. A farmer exchanged 18 bbl. of apples at \$3 a barrel for flour at \$6 a barrel. How many barrels of flour did he receive in exchange? Solve this problem by the above method.

$\frac{\overset{3}{\cancel{18}}\times3}{\underset{1}{\cancel{6}}}=\frac{9}{1}=9.$

The value of the apples ($18\times3$) is the dividend. The value of one barrel of flour (\$6) is the divisor.

5. $\frac{25\times16}{8}=?$ 6. $\frac{16\times21}{12}=?$ 7. $\frac{32\times24}{8\times3}=?$

8. How many cords of wood at \$6 a cord are equal in value to 36 bbl. of potatoes at \$3 a barrel?

## LESSON 39

*Teach the Roman numerals CM to M.*

*Teach that in all cases of two operations involving multiplication and division, the cancellation method should be used.*

### ORAL

1. $6 \times 6 \div 9 = ?$
2. $45 + 45 = ?$
3. What are the factors of **38**?
4. $19 \times 4 = ?$
5. 68 is how many times **17**?

### WRITTEN

1. $\frac{48 \times 60}{12} = ?$
2. $\frac{96 \times 36}{48} = ?$
3. $\frac{84 \times 48}{7 \times 8} = ?$
4. $\frac{64 \times 70}{120} = ?$

5. How many boxes of candy at 60¢ a box are equal in value to 12 boxes each worth 40¢?

6. Multiply 42 by 28 and divide the product by 7.

7. In an orchard there are 4650 fruit trees. $\frac{1}{3}$ of them are pear trees, $\frac{1}{5}$ are apple trees, and the rest are peach trees. How many peach trees are there?

8. If $11\frac{9}{16}$ be subtracted from a certain number, $13\frac{4}{5}$ will remain. What is the number?

9. Write 918, 928, 937, 955 in Roman numerals.

10. Add $13\frac{8}{9}$, $9\frac{2}{3}$, and $16\frac{5}{11}$.

## LESSON 40

### ORAL

1. $\frac{4\times12}{8}=?$

2. How many quarts are there in $\frac{1}{4}$ bu.?

3. A box of grape fruit contains 8 doz. How many grape fruit are there in the box?

4. $20\times4=?$

5. What number besides 5 will exactly divide 85?

### WRITTEN

1. $\frac{32\times90}{4\times20}=?$ 2. $\frac{36\times80}{45}=?$ 3. $\frac{112\times84}{12\times56}=?$

4. $\frac{54\times60}{36\times18}=?$ 5. $\frac{64\times72}{96}=?$

6. A farmer exchanged 30 bu. of potatoes for 6 boxes of soap, each containing 100 bars. How many bars did he get in exchange for one bushel?

7. A trader exchanged 80 lb. of tobacco, worth 24¢ a pound, for 160 lb. of cotton. What was the cotton worth per pound?

8. A grocer traded 20 doz. jars, worth 10¢ each, for berries at 5¢ a quart. How many bushels did he receive?

9. From $90\frac{3}{8}$ take the sum of $19\frac{1}{2}$, $46\frac{4}{5}$, and $18\frac{3}{4}$.

10. Shoes are worth $3.98 per pair wholesale. What is the cost of 8 doz. pairs?

## REVIEW X

1. A butcher bought $41\frac{1}{2}$ lb. of beef. How many pounds had he left when he sold $11\frac{3}{4}$ lb. and $15\frac{1}{16}$ lb.?

2. A lady made 12 lb. of candy, which she put up into $\frac{1}{4}$-lb. packages and sold at a fair for 25¢ each. How much did she realize?

3. A woman bought a remnant of silk of $6\frac{3}{4}$ yd. She finds that she needs $7\frac{3}{8}$ yd. How much material does she lack?

4. What must be added to $31\frac{6}{10}$ to make $37\frac{1}{2}$?

5. $\frac{77 \times 68}{44} = ?$

6. In a class of 48 pupils, $\frac{1}{2}$ had more than 90 per cent, $\frac{1}{8}$ had between 80 and 70 per cent, $\frac{1}{4}$ had between 70 and 60 per cent. The rest failed. How many failed?

7. A man gave 12 days' labor for 24 bu. of potatoes, worth 56¢ a bushel. What were his services worth per day?

8. Show by cancellation how many dozen eggs, at 32¢ a dozen, are equal in value to 16 lb. of tea, at 40¢ a pound?

9. $14{,}445 \div 45 = ?$

10. A soldier carried a rifle weighing $9\frac{3}{8}$ lb., ammunition weighing $6\frac{3}{4}$ lb., and other equipment weighing $12\frac{1}{2}$ lb. How many pounds had he to carry?

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop on signal. Write for 5 minutes. Score 5 for each correct answer. Keep results. Compare with successive trials. Note improvement in* **speed** *and* **accuracy**.

| *A* | *B* | *C* |
|---|---|---|
| $3 \times ? = 87$ | $24)\overline{?}$ | $22)\overline{?}$ |
| $\frac{1}{4}$ of $52 = ?$ | $\overline{4}$ | $\overline{3}$ |
| $\frac{1}{21}$ of $? = 4$ | $60 \div 15 = ?$ | $17)\overline{?}$ |
| $64 \div ? = 4$ | $? \times 4 = 60$ | $\overline{4}$ |
| $14 \times ? = 56$ | $?)\overline{96}$ | $? \div 13 = 4$ |
| $19)\overline{?}$ | $\overline{3}$ | $\frac{1}{20}$ of $80 = ?$ |
| $\overline{4}$ | $63 \div 21 = ?$ | $22 \times ? = 88$ |
| $? \div 4 = 24$ | $\frac{1}{3}$ of $78 = ?$ | $\frac{1}{16}$ of $64 = ?$ |
| $\frac{1}{25}$ of $? = 4$ | $72 \div ? = 18$ | $?)\overline{84}$ |
| $68 \div 4 = ?$ | $? \times 19 = 76$ | $\overline{21}$ |
| $13)\overline{52}$ | $\frac{1}{3}$ of $? = 32$ | $84 \div 3 = ?$ |
| $\overline{?}$ | $3)\overline{90}$ | $\frac{1}{24}$ of $96 = ?$ |
| $96 \div ? = 3$ | $\overline{?}$ | $? \div 23 = 4$ |
| $33 \times ? = 99$ | $88 \div 22 = ?$ | $? \times 31 = 93$ |
| $? \times 25 = 75$ | $? \times 23 = 92$ | $27 \times 3 = ?$ |
| $84 \div 4 = ?$ | $25)\overline{?}$ | $3 \times ? = 84$ |
| | $\overline{4}$ | |

## RAPID FACTOR DRILL—*Continued*

| *A* | *B* | *C* |
|---|---|---|
| $100 \div 25 = ?$ | $4)\underline{80}$ ? | $18)\underline{72}$ ? |
| $? \div 20 = 4$ | $93 \div ? = 31$ | $24 \times ? = 72$ |
| $\frac{1}{21}$ of $? = 4$ | $\frac{1}{21}$ of $63 = ?$ | $3)\underline{99}$ ? |
| $81 \div 3 = ?$ | $3)\underline{78}$ ? | $30 \times ? = 90$ |
| $\frac{1}{17}$ of $? = 4$ | $4 \times ? = 72$ | $?)\underline{93}$ 31 |
| $3 \times ? = 72$ | $?)\underline{63}$ 21 | $23)\underline{92}$ ? |
| $? \div 4 = 19$ | $4)\underline{56}$ ? | $4 \times 16 = ?$ |
| $\frac{1}{3}$ of $? = 23$ | $? \div 3 = 23$ | $28)\underline{?}$ 3 |
| $56 \div ? = 4$ | $?)\underline{69}$ 3 | $3)\underline{87}$ ? |
| $? \times 25 = 75$ | $?)\underline{88}$ 22 | $? \times 29 = 87$ |
| $?)\underline{63}$ 21 | $? \div 3 = 22$ | $3 \times ? = 81$ |
| $? \div 3 = 33$ | | |
| $15)\underline{?}$ 4 | | |
| $66 \div 33 = ?$ | | |

## TYPE XVI

### GIVEN THE COST OF MANY TO FIND THE COST OF MANY (CANCELLATION)

NOTE TO THE TEACHER: *Call the attention of the pupils to the difference between Types XV and XVI.*

1. If 4 apples cost 20¢, what will 5 apples cost?

$$20 \div 4 \text{ or } \frac{20}{4} = \text{cost of one apple.}$$

$$\frac{20}{4} \times 5 \quad \text{or} \quad \frac{20 \times 5}{4} = \text{cost of 5 apples.}$$

$$\frac{20 \times 5}{4} = \frac{25}{1} = 25 \text{ cents.}$$

2. If 8 chairs cost $32, what will 15 chairs cost?

3. What will 16 books cost, if 2 books cost $3?

4. At the rate of 6 oranges for 25¢, what must I pay for 18 oranges?

5. If there are 72 in. in 6 ft., how many inches are there in 18 ft.?

6. If 360 qt. of milk are contained in 9 cans, how many quarts will 11 cans of the same size contain?

7. A merchant sold 32 yd. of cloth for $48. What would he receive for 10 yd. at the same price?

## LESSON 41

### ORAL

1. If 3 baskets of apples cost 75¢, what is the cost of 2 baskets?

2. How many quarts are there in $\frac{3}{8}$ of a bushel?

3. How many feet are there in a mile?

4. $19 \times 5 = ?$

5. How many 20's are there in 40?

### WRITTEN

1. If 8 yd. of ribbon cost 72 cents, what will 15 yd. cost?

2. A merchant paid $192 for 16 suits of clothes. What would 9 suits cost at the same rate?

3. 3600 oranges are packed in 15 boxes. How many oranges are there in 12 of the boxes?

4. Find the cost of 14 bbl. of sugar, each weighing 390 lb., at $.04 per pound.

5. Write in Roman numerals 989, 917, 957, 314, 465.

6. 48 bu. of fruit were placed in 24 boxes. How many quarts were put in each box? (Cancellation.)

7. If 12 loads of potatoes, each containing 54 pk., were divided among 162 families, how many pecks did each family receive?

8. How many feet are there in 2 mi.?

9. $45\frac{2}{3} + 37\frac{4}{5} + 19\frac{1}{2} + 36\frac{5}{8} = ?$

10. $100 - 2\frac{1}{2}\frac{1}{4} = ?$

## LESSON 42

### ORAL

1. $\frac{6\times14}{7}=?$
2. $5\frac{1}{3}+2\frac{2}{3}=?$
3. $27+37=?$
4. What will 22 three-cent stamps cost?
5. At 18¢ each, how many melons may be bought for 54¢?

### WRITTEN

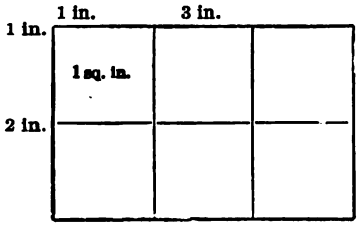
1. A book dealer sold 84 books for $252. If he sold 35 more at the same price, what did he get for them?
2. 58 men can do a piece of work in 5 days. How long will it take 29 men to do the work? (Cancellation.)
3. 36 yd. of lace cost $144. Find the cost of 27 yd.
4. $\frac{12\times144}{9\times16}=?$
5. $\frac{54\times84}{63\times24}=?$
6. 16 cans of milk, each containing 40 qt., are poured into smaller cans of 8 qt. each. How many 8-qt. cans were used?
7. When 16 bbl. contain 48 bu., how many barrels are needed for 72 bu.? (Cancellation.)
8. $384\frac{2}{3}+146\frac{3}{4}-409\frac{7}{8}=?$
9. A man sold 56 horses for $12,600, thereby gaining $12.50 on each. Find the cost of each horse.
10. A real estate dealer bought a farm of 48 acres for $2700 and sold it at a loss of $5.75 an acre. For how much did he sell the farm?

## TYPE XVII

*Teach the term* **area.**

*Teach the units square inch, square foot, square yard. Have pupils measure sheets of paper, desk tops, a blackboard, etc., and apply units taught.*

1. How many square inches are there in a sheet of paper 2 in. wide and 3 in. long?




(*A*) By applying the unit of measure, 1 sq. in., to the length of the surface we find that there are 3 sq. in. in one row of squares.

(*B*) By applying the same unit across the width of the surface we find that there are 2 rows of squares.

Since there are 3 sq. in. in one row, and there are two rows of squares, the whole area will contain $2 \times 3$ sq. in. = 6 sq. in.

2. How many square inches are there in a desk top 30 in. long and 16 in. wide?

3. How many square feet are there in the floor of a room 18 ft. long and 15 ft. wide?

4. A lawn is 24 yd. long and 15 yd. wide. How many square yards are there in the lawn?

5. What is the area of a brick wall 80 ft. long and 36 ft. high?

6. At 10¢ a square foot, what is the cost of sodding a plot 45 ft. long and 30 ft. wide?

7. What will be the cost of plastering a wall 16 yd. long and 5 yd. wide, at 35¢ a square yard?

## LESSON 43

### ORAL

1. How many square inches are there in a piece of paper 9 in. long and 6 in. wide?

2. $\frac{7\times12}{6}=?$

3. If you pay 45¢ for 3 cans of fruit, what will 4 cans cost at the same price?

4. $4\frac{1}{4}+2\frac{1}{4}=?$

5. $22\times?=44.$

### WRITTEN

1. Find the area of a floor 15 ft. long and 8 ft. wide.

2. How many square feet are there in a floor 12 ft. long and 16 ft. wide?

3. What is the area of a desk top 36 in. long and 15 in. wide?

4. What is the area of a field 209 ft. by 125 ft.?

5. How many square yards are there in a lot 25 yd. square?

6. $\frac{96\times45}{24\times30}=?$

7. Find the cost of 25 lb. of candy when 15 lb. cost $12.

8. A dealer had $986\frac{1}{4}$ tons of coal. He sold all but $76\frac{5}{8}$ tons. How many tons did he sell?

9. $14\frac{1}{7}+16\frac{2}{3}+27\frac{3}{4}+16\frac{5}{14}=?$

10. Add 286,564; 98,572; 6844; 397,789; 6785; 65,965; 128,918.

## LESSON 44

### ORAL

1. How many square yards are there in a floor 6 yd. square?

2. $\frac{10 \times 10}{20} = ?$

3. Find $\frac{5}{12}$ of 84.

4. $23 \times 2 = ?$

5. What are the factors of 69?

### WRITTEN

1. How many square yards are there in a lot 72 yd. square?

2. What is the area of a plot of land 49 ft. by 106 ft.?

3. How many city lots are there in a piece of land 1100 ft. long and 75 ft. wide? (A city lot is 25 by 100.)

4. How many city lots can be cut from an area 250 ft. by 400 ft.?

5. What is the area of a rug 72 in. long and 36 in. wide?

6. Write the Roman numerals for 236, 804, 427, 983, 461.

7. The government bought in one year 14 aeroplanes for $35,000. The next year 21 were bought at the same price each. How large an appropriation was needed the second year?

8. A grain dealer sold $2850\frac{3}{4}$ bu. and had $84\frac{3}{10}$ bu. left. How many bushels had he at first?

9. How much is $\frac{7}{12}$ of 3648?

10. $\frac{45 \times 72}{30 \times 27} = ?$

## REVIEW XI

1. I bought 4 baskets of peaches, each containing 16 qt., and put them into 96 cans. If $\frac{1}{4}$ of the material was lost in canning, how much did each can hold?

2. A dealer sold 125 books at 19¢ each, gaining $5. What was the cost of each book?

3. What will it cost to purchase a piece of land 90 ft. long and 30 ft. wide at 40¢ a square foot?

4. $\frac{96 \times 45}{15 \times 72} = ?$

5. $24\frac{9}{16} + 59\frac{11}{12} - 65\frac{7}{8} = ?$

6. How many city lots, each 25 ft. by 100 ft., may be cut from a piece of land 500 ft. by 200 ft.?

7. A family spends $24 a month for rent and $\frac{3}{8}$ as much for meat. How much does it spend in a year for both?

8. Divide 2,181,417 by 763.

9. At 75¢ a bushel, what is the value of 3 loads of grain, each containing 768 bu.

10. A young man earns $15 a week. If his expenses are $13 a week, how many dollars will he save in one year?

## ADDITION DRILL

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| 647,580 | 756,486 | 86,574 | 67,584 | 56,478 |
| 76,854 | 7,564 | 53,421 | 64,539 | 5,342 |
| 345,364 | 546,321 | 7,564 | 3,425 | 68,709 |
| 9,786 | 8,675 | 64,532 | 76,856 | 46,573 |
| 54,631 | 546,323 | 867 | 6,453 | 675 |
| 6,479 | 657 | 64,539 | 97,866 | 45,362 |
| 64,538 | 64,531 | 8,273 | 897 | 97,823 |
| 6,572 | 8,674 | 6,453 | 75,640 | 768 |
| 5,473 | 97,865 | 57,643 | 8,675 | 64,755 |
| 534,237 | 645 | 14,141 | 645,313 | 645 |
| 645,768 | 758,755 | 5,768 | 7,869 | 675 |
| 5,746 | 87,961 | 56,472 | 45,362 | 6,574 |
| 86,759 | 109,817 | 8,576 | 45,362 | 12,430 |
| 536,274 | 561,754 | 564,724 | 7,685 | 75,645 |
| 56,471 | 65,749 | 8,797 | 536,217 | 35,475 |
| 971 | 647,598 | 75,647 | 57,685 | 784,598 |
| 867,511 | 513,426 | 1,971 | 354,628 | 675,017 |
| 649,817 | 7,564 | 756 | 5,621 | 64,538 |
| 859,768 | 76,851 | 56,419 | 7,560 | 3,429 |
| 76,855 | 7,243 | 9,808 | 76,054 | 596,075 |

## ADDITION DRILL—*Continued*

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| $879.75 | $563.95 | 45.34 | $52.85 | $386.04 |
| 347.08 | 56.20 | 75.42 | 8.53 | 8.74 |
| 43.87 | 473.96 | 97.53 | 98.64 | 47.93 |
| 6754.98 | 56.09 | 52.76 | 4.74 | 49.23 |
| 76.54 | 38,696.64 | 72.84 | 452.86 | 94.25 |
| 45.09 | 5,643.82 | 98.53 | 75.97 | 4588.53 |
| 5640.00 | 64.82 | 92.09 | 6.70 | 986.03 |
| 765.07 | 453.94 | 450.00 | 86.52 | 25.86 |
| 452.10 | 430.90 | 549.64 | 59.40 | 87,563.35 |
| 56.50 | 486.53 | 34.02 | 64.07 | 874.55 |

| | | | | |
|---|---|---|---|---|
| 645,877 | 65,748 | 981,655 | 68,745 | 56,473 |
| 45,382 | 564,093 | 764 | 798,546 | 78,691 |
| 87,961 | 564 | 874,365 | 18,987 | 657,481 |
| 879 | 564,789 | 98,017 | 675 | 8,967 |
| 573,428 | 65,741 | 574,435 | 763,425 | 45,362 |
| 6,758 | 651,342 | 87,955 | 67,131 | 6,780 |
| 453,768 | 5,647 | 87,654 | 44,156 | 56,411 |
| 769,845 | 879,120 | 87,965 | 76,545 | 57,632 |
| 67,586 | 7,683 | 98,054 | 98,160 | 56,473 |
| 651,136 | 562,345 | 87,171 | 871,516 | 56,473 |

## LESSON 45

*Teach that 144 sq. in. = 1 sq. ft.*

### ORAL

1. How many square inches are there in $\frac{1}{2}$ sq. ft.?
2. What is the area of a table top 4 ft. square?
3. Find $\frac{1}{4}$ of \$96.
4. $\frac{9 \times 12}{6} = ?$
5. $95 \div 5 = ?$

### WRITTEN

1. How many square feet are there on a surface 96 in. square?

$$\frac{96 \times 96}{144} = ?$$

2. Find the area in square feet of a surface 132 in. long and 120 in. wide?
3. How many city lots are there in a piece of land 800 ft. long and 125 ft. wide?
4. How many square inches are there in a piece of cardboard 4 ft. long and 2 ft. wide?
5. How many city lots are there in land 600 ft. by 275 ft.?
6. How many square feet of plaster are there on a wall 36 ft. long and 9 ft. high?
7. Write the Roman numerals for 289, 327, 614, 965, 706.
8. In the pens of a stockyard there are 3978 animals. $\frac{2}{3}$ are cattle, $\frac{1}{6}$ are sheep, and the rest are hogs. How many are there of each?
9. $\frac{66 \times 64}{44 \times 32} = ?$
10. A pole $53\frac{7}{8}$ ft. long was cut into three pieces. If one piece is $16\frac{2}{3}$ ft. long, and another is $24\frac{3}{4}$ ft. long, how long is the third?

## LESSON 46

### ORAL

1. What is the area of a floor 5 yd. by 9 yd.?
2. XC + IV = ?
3. $\frac{14 \times 10}{7} = ?$
4. 82 − 28 = ?
5. How many square inches are there in $\frac{1}{12}$ sq. ft.?

### WRITTEN

1. A parlor floor is 20 ft. long and 18 ft. wide. How many square feet are there in it? Reduce the answer to square inches.

2. How many square yards of linoleum are needed to cover a floor 8 yd. long and 4 yd. wide?

3. Find the area (in square yards) of a field 72 yd. square.

4. How many square inches of paper are there in a sheet 4 ft. long and 2 ft. wide?

5. A piece of land 975 ft. long and 100 ft. wide was cut into city lots. How many lots were there?

6. Write the Roman numerals for 206, 409, 327, 918, 465.

7. Find the number of square feet in 8640 sq. in.

8. A man earns $50 per month. He spends $12.50 for rent and $26.75 for other expenses. How much does he save in 3 mo.?

9. $\frac{96 \times 42}{28 \times 16} = ?$

10. Reduce 120 sq. ft. to square inches.

## LESSON 47

*Teach that 9 sq. ft. = 1 sq. yd.*

### ORAL

1. Change 72 sq. ft. to square yards.
2. How many square feet are there in a piece of oilcloth 2 yd. square?
3. How much change will be given from a half dollar, if the purchase amounts to 28¢?
4. If 3 collars cost 45¢, what will 6 collars cost?
5. $33 \times 3 = ?$

### WRITTEN

1. What will it cost to sod a lawn 108 ft. long and 25 ft. wide at 10¢ per square yard?

$$\frac{108 \times 25}{9} = ?$$

2. Find the cost to paint a floor 18 ft. by 12 ft. at 9¢ a square yard?
3. How many square yards are there in a floor 39 ft. long and 27 ft. wide?
4. How much will it cost to sod a lawn 18 yd. long and 20 yd. wide at 20¢ a square foot?
5. A man wants to plaster a wall 9 yd. long by 6 yd. wide. At 12¢ a square foot, what will it cost?
6. How much will be left from $200 after buying 209 books at $.79 each?
7. At 25¢ a yard, what will 18 bolts of ribbon cost, if each bolt contains 25 yd.?
8. Find the cost of oilcloth needed for a floor 18 ft. by 16 ft. at 80¢ a square yard.
9. Find the cost of 18 firkins of butter, each containing 36 lb., at 34¢ a pound.
10. What will 32 tables cost if I pay $168 for 48 tables?

## LESSON 48

### ORAL

1. How many square yards are there in a floor containing 108 sq. ft.?

2. How many square inches are there in $\frac{1}{3}$ sq. ft.?

3. $4+5+16=?$

4. I bought 2 packages of raisins @ 12¢ and gave the grocer 3 dimes in payment. What change should he give me?

5. What will 5 toys cost when 2 cost 38¢?

### WRITTEN

1. What will it cost to plaster a wall 21 ft. long and 15 ft. wide at $.45 a square yard?

2. Mr. Gray's lawn is 12 yd. by 16 yd. What will it cost to sod it at $.03 a square foot?

3. A floor is 42 ft. by 27 ft. What will it cost to cover it with linoleum at $.45 a square yard?

4. At $.85 a square yard, what will it cost to put oilcloth on a floor 21 ft. by 15 ft.?

5. At $.09 a square foot, what will be the cost of a floor 12 yd. long by 6 yd. wide?

6. $157.92 is the cost of 48 books. Find the cost of 309 books.

7. How much is left of $100 after buying 27 chairs at $2.98 each?

8. Add 268,782; 39,896; 387,497; 172,349; 398.

9. Add $37.95; $9,097.38; $693.18; $28.67; $984.75.

10. At $.10 a square inch, what will it cost to enamel a shield 2 ft. long and 1 ft. wide?

## REVIEW XII

1. At \$1.50 a square yard, what will it cost to cover with linoleum a kitchen floor 9 ft. by 12 ft.?

2. Last week before practice, a boy could jump $48\frac{1}{2}$ in. Now he can jump $55\frac{3}{8}$ in. How much has he gained?

3. How many square feet are there in a piece of paper 45 in. by 16 in.?

4. A grocer who had 16 bu. of apples sold $\frac{3}{8}$ of them at 35¢ a peck and the remainder at 25¢ a peck. What did he receive for them?

5. From A to B it is $13\frac{1}{2}$ miles; from B to C it is $17\frac{7}{8}$ miles; and from C to D it is $11\frac{7}{10}$ mi. How far is it from A to D?

6. When one has traveled 25 mi. from A towards C, how far from C is he?

7. A factory made in one year 650,000 cigars, which were sold for 5¢ each. The material used cost \$8000 and other expenses were \$19,600. How much profit was made?

8. A and B are 75 mi. apart. If they travel towards each other, one $24\frac{1}{2}$ mi. and the other $29\frac{2}{3}$ mi., how far apart will they be?

9. How many inch squares can be drawn on a piece of paper 2 ft. long and $1\frac{1}{2}$ ft. wide?

10. At 14¢ a square foot, what will 5 sq. yd. of tin cost?

## DIVISION DRILL

### *A*

1. 514)1,878,156
2. 117)427,518
3. 813)3,467,445
4. 624)2,721,888
5. 127)821,055
6. 207)1,160,028
7. 623)1,647,835
8. 543)1,435,149
9. 824)4,337,536
10. 415)1,478,645
11. 327)1,521,204
12. 521)1,878,205
13. 225)980,100
14. 634)3,210,576
15. 832)3,631,680

### *B*

1. 416)1,935,232
2. 219)798,255
3. 823)3,828,596
4. 625)2,281,875
5. 319)690,316
6. 924)5,178,096
7. 716)2,614,832
8. 317)1,982,518
9. 931)3,031,336
10. 734)2,396,510
11. 418)1,526,118
12. 239)828,135
13. 825)5,381,475
14. 417)1,511,625
15. 238)1,550,094

### C

1. 821)5,364,414
2. 526)1,927,790
3. 328)546,120
4. 934)2,470,430
5. 531)2,470,212
6. 318)1,152,750
7. 913)2,888,732
8. 635)1,311,910
9. 419)1,050,014
10. 534)1,406,022
11. 615)2,191,860
12. 428)1,008,368
13. 128)301,312
14. 725)3,373,425
15. 517)1,584.605

### *D*

1. 637)3,594,591
2. 724)3,368,772
3. 516)1,369,464
4. 247)1,540,045
5. 834)2,204,262
6. 617)2,568,571
7. 429)709,566
8. 157)1,144,373
9. 765)6,057,270
10. 476)941,528
11. 249)407,115
12. 527)230,826
13. 627)248,292
14. 921)393,128
15. 420)315,200

## REVIEW D

1. How much does a person lack of having \$50, if he has 3 five-dollar bills, seven 2's, four 1's, 3 half-dollars, 5 quarters, and 4 five-cent pieces?

2 A. dealer sold 47 beeves, averaging 874 lb., each at 7¢ a pound. How much was received?

3. A man received \$54 for 12 days' work. How much did he receive for 8 days' work?

4. If 12 pieces of cloth, each piece containing 15 yd., cost \$360, what do 24 yd. cost?

5. Divide $81 \times 44$ by 99.

6. Simplify $768+354-168-243+784-186+628$.

7. A man sold a house for \$4875 and lost \$465. How much did he pay for it?

8. A man gave his son \$4750 and his daughter \$975 less. How much did he give to both?

9. At 6¢ a quart, how much will 33 gal. of milk cost?

10. How many dozen blank books will it take to supply the pupils in 12 class-rooms of 43 pupils each, if each pupil is to have 2 books?

11. How many gallons of milk does your mother use in September, if she uses 2 qt. a day?

12. What sum of money must be added to \$285.38 to make three hundred twenty-five dollars?

13. A man bought a house for \$5600 and an auto for $\frac{3}{16}$ as much. How much did the auto cost?

## REVIEW D—*Continued*

14. A man bought 128 acres at \$8 an acre. He sold $\frac{1}{4}$ of it at \$25 an acre and the remainder at \$5 an acre. How much did he gain?

15. A farmer sold 125 sheep, lost 39, and had 209 left. How many did he have at first?

16. If a man earns \$1250 a year and spends \$95 each month, how much can he save in 5 yr.?

17. How much is gained on 12,675 lb. of wool bought @ 19¢ and sold @ 23¢?

18. If 6 acres cost \$750, what will 19 acres cost at the same rate?

19. A man having \$7200 in the bank, drew out $\frac{4}{5}$ of it. He spent $\frac{3}{4}$ of what he drew out for a house and the remainder for an auto. How much did the auto cost?

20. At 36¢ a dozen, how many eggs can be bought for 90¢?

21. If 6 yd. of silk cost \$9, what will 8 yd. cost? (Cancellation.)

22. A piece of paper is 4 ft. long and half as wide. How many square inches in it?

23. How many pieces of ribbon, each 18 in. long, can be cut from a piece 7 yd. long?

24. A man bought land at \$15 an acre and paid \$1350 for it. He sold it at \$18.75 an acre. How many acres did he have and how much did he gain?

25. A boat lacks 3 in. of being 25 ft. long. How long is it?

## REVIEW D—*Continued*

26. If a man feeds his horse 8 qt. of oats a day, how long will 16 bu. last?

27. If a horse eats a peck of oats a day, how many bushels will a stable keeper need to feed 16 horses for two weeks?

28. $29\frac{7}{8}+28\frac{5}{6}+35\frac{3}{4}-79\frac{1}{2}=?$

29. What is the difference between the sum of $19\frac{4}{7}$ and $25\frac{4}{5}$, and the sum of $35\frac{2}{3}$ and $49\frac{1}{2}$?

30. Add 4869, 3794, 1578, 5685, 2456, 7249.

31. Simplify $5932+6897-3257+4687-5934$.

32. In a certain town there are 579 men, 68 more women than men, and as many children as men and women together. What is the population of the town?

33. The operating expenses of a street railway company for the year were \$125,103.75. How much was it per day?

34. A delivery auto ran 28 days at an average of 40 mi. per day and a total cost of \$44.80. What was the average cost per mile?

35. A flour mill produces each hour 560 sacks of 7 lb. each. If this flour was packed in barrels of 196 lb. each, how many barrels would be filled?

36. A dealer sold 624 lb. of butter for \$187.20 and gained 3¢ a pound. What did it cost him per pound?

37. How many square feet are there in a lot 125 ft. by 33 ft.?

## REVIEW D—*Continued*

38. How many lots, each containing 7260 sq. ft., can be cut from 3 acres of 43,560 sq. ft. each?

39. The product of two numbers is 5106. One number is 69. What is the other?

40. Change $\frac{537}{13}$ to a mixed number.

41. Write the Roman numerals for 814, 759, 661.

42. A wholesaler bought 5 carloads of coal, each weighing 50 long tons of 2240 lb. each. How many pounds did he buy?

43. If he sold it by the short ton of 2000 lb. each, how many tons did he sell?

44. A man walked $37\frac{5}{8}$ mi. one day and $7\frac{3}{4}$ mi. less the next. How many miles did he walk in both days?

45. If 10 bu. of potatoes cost \$8, what will 75 bu. cost?

46. At 60¢ a bushel, what should I pay for 2 pk. of corn?

47. How many square feet are there in a sidewalk 25 yd. long and 2 yd. wide?

48. From $\frac{7}{8}$ of 776 take $\frac{5}{6}$ of 558.

49. A farmer raised 675 bu. of wheat and sold $\frac{4}{5}$ of it at 95¢ a bushel. How much did he get for it?

50. Find the amount of this bill: 6 lb. sugar @ 7¢; $\frac{1}{2}$ lb. tea @ 68¢· 2 lb. coffee @ 36¢; 2 doz. eggs @ 29¢; 3 boxes crackers @ 10¢; 3 lb. butter @ 37¢.

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep results and compare with successive trials. Note improvement in* **speed** *and* **accuracy.**

| *A* | *B* | *C* |
|---|---|---|
| $\frac{1}{5}$ of 95 = ? | $\frac{1}{5}$ of 80 = ? | $\frac{1}{6}$ of 90 = ? |
| ?)100 | 100 ÷ 20 = ? | ?)98 |
| 5 | ? × 6 = 78 | 7 |
| ? × 7 = 98 | 15)? | 78 ÷ 13 = ? |
| ? ÷ 18 = 5 | 6 | 16 × ? = 99 |
| $\frac{1}{15}$ of 75 = ? | 95 ÷ 5 = ? | ? × 15 = 90 |
| 70 ÷ 5 = ? | ? × 5 = 70 | ?)75 |
| 5) ? | 16)80 | 15 |
| 14 | ? | ? × 17 = 85 |
| ? × 13 = 65 | ? ÷ 5 = 15 | ?)95 |
| 98 ÷ ? = 14 | 20 × 5 = ? | 19 |
| 80 ÷ 16 = ? | 13 × ? = 78 | 16 × 5 = ? |
| 5 × ? = 90 | 18)? | $\frac{1}{13}$ of 91 = ? |
| ? ÷ 13 = 5 | 5 | 91 ÷ 7 = ? |
| $\frac{1}{14}$ of 84 = ? | 17 × 5 = ? | 6 × 13 = ? |
| 17)85 | 16)? | 5)65 |
| ? | 6 | ? |
| 96 ÷ 6 = ? | 84 ÷ 6 = ? | ?)84 |
| | | 14 |

## FRACTION DRILL III

### Short Method

$\frac{3}{4}+\frac{2}{3}=?$ $\qquad (3\times3)+(4\times2)$

$$\frac{3}{4}+\frac{2}{3}=\frac{17}{12}=1\tfrac{5}{12}$$

$(4\times3)$

Rule: *Same as Drill II.*

$\frac{2}{3}+\frac{3}{4}=?$ $\quad$ $\frac{3}{4}+\frac{6}{7}=?$ $\quad$ $\frac{5}{6}+\frac{7}{8}=?$

$\frac{2}{3}+\frac{4}{5}=?$ $\quad$ $\frac{3}{4}+\frac{7}{8}=?$ $\quad$ $\frac{5}{6}+\frac{8}{9}=?$

$\frac{2}{3}+\frac{5}{6}=?$ $\quad$ $\frac{3}{4}+\frac{8}{9}=?$ $\quad$ $\frac{5}{6}+\frac{9}{10}=?$

$\frac{2}{3}+\frac{6}{7}=?$ $\quad$ $\frac{3}{4}+\frac{9}{10}=?$ $\quad$ $\frac{6}{7}+\frac{7}{8}=?$

$\frac{2}{3}+\frac{7}{8}=?$ $\quad$ $\frac{4}{5}+\frac{5}{6}=?$ $\quad$ $\frac{6}{7}+\frac{8}{9}=?$

$\frac{2}{3}+\frac{8}{9}=?$ $\quad$ $\frac{4}{5}+\frac{6}{7}=?$ $\quad$ $\frac{6}{7}+\frac{9}{10}=?$

$\frac{2}{3}+\frac{9}{10}=?$ $\quad$ $\frac{4}{5}+\frac{7}{8}=?$ $\quad$ $\frac{7}{8}+\frac{8}{9}=?$

$\frac{3}{4}+\frac{4}{5}=?$ $\quad$ $\frac{4}{5}+\frac{8}{9}=?$ $\quad$ $\frac{7}{8}+\frac{9}{10}=?$

$\frac{3}{4}+\frac{5}{6}=?$ $\quad$ $\frac{4}{5}+\frac{9}{10}=?$ $\quad$ $\frac{8}{9}+\frac{9}{10}=?$

$\frac{5}{6}+\frac{6}{7}=?$

## TYPE XVIII

**MULTIPLICATION OF AN INTEGER BY A MIXED NUMBER CONSISTING OF A UNIT, AND A FRACTION WHOSE NUMERATOR IS A UNIT**

1. Multiply 12 by $1\frac{1}{2}$.

$$\begin{array}{r} 12 \\ 1\frac{1}{2} \\ \hline 6 \\ 12 \\ \hline 18 \quad \textit{Ans.} \end{array}$$

*A*. Find $\frac{1}{2}$ of 12. $\frac{1}{2}$ of $12 = 6$.

*B*. Multiply 12 by 1. $1 \times 12 = 12$.

*C*. Add 6 and 12. $6 + 12 = 18$. *Ans.*

To multiply an integer by $1\frac{1}{2}$, $1\frac{1}{3}$, $1\frac{1}{4}$, etc., first multiply the integer by the fraction; second, multiply the integer by the unit; third, add the two products.

2. $48 \times 1\frac{1}{4} = ?$
3. Multiply 36 by $1\frac{1}{3}$.
4. What is the product when 30 is multiplied by $1\frac{1}{5}$?
5. $95 \times 1\frac{1}{5} = ?$
6. $60 \times 1\frac{1}{3}$
7. $72 \times 1\frac{1}{2}$
8. $96 \times 1\frac{1}{6}$
9. $64 \times 1\frac{1}{4}$
10. What will 24 books cost at $\$1\frac{1}{2}$ each?

## LESSON 49

### ORAL

1. What will $1\frac{1}{4}$ lb. of meat cost at 20¢ a pound?
2. How many square feet are there in $1\frac{1}{3}$ sq. yd.?
3. Change 23 ft. to yards.
4. How many oranges are there in 11 doz. oranges?
5. $4\frac{2}{3}+3\frac{2}{3}=?$

### WRITTEN

1. If a yard of cloth costs \$3.60, what will $1\frac{1}{4}$ yd. cost?

2. There are 144 sq. in. in a square foot. How many square inches are there in $1\frac{1}{8}$ sq. ft.?

3. At 12¢ per square inch, what will $1\frac{1}{9}$ sq. ft. of sheet silver cost?

4. It takes $1\frac{1}{2}$ yd. of cloth for a waist. Find the cost at \$2.25 per yard.

5. How many square feet are there in a piece of land 59 yd. by 32 yd.?

6. Find the area (in square yards) of a lawn 93 ft. by 39 ft.

7. How many city lots are there in land 300 ft. by 175 ft.?

8. I bought a house for \$3000. I sold it for \$3045.80. How much was the gain?

9. If I buy 5 doz. eggs at 5¢ apiece, what will they cost?

10. Subtract $301\frac{2}{5}$ from $3007\frac{1}{10}$.

## LESSON 50

### ORAL

1. Multiply 24 by $1\frac{1}{8}$.
2. How many square yards are there in 144 sq. ft.?
3. How many 5ths are there in 16?
4. $\frac{5}{6} = \frac{?}{24}$?
5. Take the sum of 16 and 14 from 70

### WRITTEN

1. A sheet of paper is 40 in. by 36 in. It takes $1\frac{1}{6}$ sheets to make a dozen hand bills. How many square inches of paper will be needed?

2. A pump raises $1\frac{1}{12}$ gal. of water at each stroke. How many gallons will be raised in 288 strokes?

3. Mr. Gray ordered 3 boxes of candy, each weighing 12 lb., at 9¢ a pound. How much was his bill? He ordered another lot $1\frac{1}{4}$ times as large. What was the amount of the second order?

4. Mr. B.'s pasture is 477 ft. long and 320 ft. wide. How many square yards are there in it?

5. How many square feet are there in a lawn 38 ft. by 46 ft.?

6. An orchard is planted with a tree to each 40 sq. yd. The orchard is 144 yd. long and 65 yd. wide. How many trees are there?

7. I had $487\frac{1}{2}$ mi. to go. One day I went $137\frac{3}{16}$ mi. and on the next $184\frac{5}{8}$ mi. How much further had I then to go?

8. Write in words 707,016; 38,404; 10,010.

9. $\frac{14 \times 36 \times 8}{7 \times 16} = ?$

10. (*a*) Reduce 48 to a fraction whose denominator is 16.
(*b*) Reduce $184\frac{5}{12}$ to twelfths.

## LESSON 51

### ORAL

1. Change 45 sq. ft. to square yards.
2. At 30¢ a yard, what will $1\frac{1}{2}$ yd. of lace cost?
3. How many dozen are there in 120 pen points?
4. What is the area of a piece of zinc 8 in. wide and 15 in. long?
5. A grocer sold $\frac{5}{6}$ of a case containing 24 cans of peas. How many cans had he left?

### WRITTEN

1. If it costs $85.40 to equip an automobile with tires, what will 3 new tires of the same kind cost?
2. Find the area in square yards of land 270 ft. by 118 ft.
3. A dealer bought $1\frac{1}{3}$ bolts of ribbon, each containing 15 yd., at 14¢ a yard. What did it cost?
4. Find the area of a field 206 ft. long and 80 ft. wide.
5. Multiply 726 by 320.
6. Find the cost of 20 doz. pencils at $.04 apiece.
7. From three hundred eighty-seven thousand seven hundred eight take one hundred forty-two thousand six hundred nineteen.
8. A man bought $2000 worth of stock for his store. He invested $\frac{3}{10}$ of it in clothing, $\frac{1}{8}$ of it in shoes. The rest of the money was spent for miscellaneous stock. What was spent for each?
9. A man raised 560 chickens. He sold $\frac{5}{14}$ of them. How many did he sell?
10. What will it cost to sod a field 108 ft. by 60 ft. at $.75 a square yard?

## LESSON 52

### ORAL

1. $20 \times 4 = ?$
2. What are the dimensions of a city lot?
3. How many inches are there in $1\frac{1}{2}$ ft.?
4. $47 + 47 = ?$
5. What is the difference between 68 and 83?

### WRITTEN

1. When \$4.75 is the cost of a leather bag, what will 110 such bags cost?
2. Find the number of square feet in land 180 ft. by 200 ft.
3. There are 40 crates of eggs, each containing 30 doz What will they sell for at 35¢ a dozen?
4. Find the area of a floor 60 ft. long and 20 ft. wide.
5. Multiply 608 by 304.
6. How many city lots are there in land 2700 ft. long by 150 ft. wide?
7. Add one hundred thousand seventy-three; six thousand five hundred four; seventy thousand ten.
8. John has \$14.75 in the bank. Henry has $1\frac{1}{5}$ times as much. How much has Henry?
9. Find $\frac{5}{16}$ of 800.
10. How many square yards of oilcloth are needed to cover a floor 15 ft. by 12 ft.?

## REVIEW XIII

1. At 23¢ a square foot, what will it cost to lay a concrete walk 120 ft. long and 5 ft. wide?

2. How many square inches are there on a piece of paper 3 ft. long and 32 in. wide?

3. At 4¢ a pound, what is the value of 20 bags of meal, each containing 68 lb.?

4. How much will $1\frac{1}{2}$ bu. of potatoes cost at 30¢ a peck?

5. In a tank which can hold 63 gal., there have been put $23\frac{3}{4}$ gal. and $15\frac{1}{2}$ gal. There have been taken out $19\frac{5}{8}$ gal. How many gallons must be put in to fill it?

6. A dealer having 434 tons of coal, sold $\frac{3}{7}$ of it, and then bought 125 tons more. How many tons had he then?

7. At 25¢ a square yard, what will it cost to plaster a ceiling 15 ft. by 12 ft.?

8. If 28 bbl. of flour cost $135.80, how much will 48 bbl. cost?

9. How many lots 25 ft. by 100 ft. can be made from land 300 ft. by 750 ft.?

10. How many quarts are there in $1\frac{1}{8}$ bu.?

## MULTIPLICATION DRILL

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| 7285 | 6879 | 2798 | 4859 | 6598 |
| ×147 | ×897 | ×987 | ×978 | ×875 |
| 9306 | 7789 | 3987 | 8967 | 4398 |
| ×258 | ×798 | ×789 | ×689 | ×785 |
| 4178 | 8987 | 8974 | 6985 | 5697 |
| ×369 | ×709 | ×897 | ×869 | ×875 |
| 7285 | 9798 | 5987 | 6948 | 5684 |
| ×258 | ×807 | ×978 | ×968 | ×758 |
| 9306 | 1897 | 9786 | 5986 | 6587 |
| ×369 | ×708 | ×897 | ×698 | ×857 |
| 4178 | 7528 | 9787 | 4958 | 8769 |
| ×417 | ×741 | ×798 | ×896 | ×587 |
| 7825 | 9603 | 8797 | 5968 | 9847 |
| ×267 | ×285 | ×709 | ×986 | ×679 |

## MULTIPLICATION DRILL—*Continued*

| *A* | *B* | *C* | *D* | *E* |
|---|---|---|---|---|
| 7825 | 8714 | 9879 | 9687 | 6598 |
| ×639 | ×396 | ×708 | ×687 | ×976 |
| 9063 | 5827 | 1978 | 5987 | 6589 |
| ×714 | ×528 | ×807 | ×876 | ×769 |
| 4781 | 6903 | 9786 | 3987 | 5489 |
| ×582 | ×936 | ×987 | ×768 | ×697 |
| 2978 | 8174 | 6978 | 6857 | 5478 |
| ×789 | ×471 | ×879 | ×678 | ×967 |
| 3798 | 5782 | 5987 | 5984 | 6589 |
| ×987 | ×396 | ×789 | ×867 | ×796 |
| 4987 | 6903 | 4876 | 6758 | 8769 |
| ×879 | ×417 | ×798 | ×786 | ×679 |
| 5897 | 1874 | 4869 | 8697 | 5497 |
| ×978 | ×825 | ×897 | ×578 | ×468 |

## LESSON 53

### ORAL

1. $80 \div 20 = ?$
2. Find $\frac{2}{3}$ of 60.
3. How many square feet are there in a walk 25 ft. long and 4 ft. wide?
4. Multiply 36 by $1\frac{1}{6}$.
5. $75 - 37 = ?$

### WRITTEN

1. When \$980 is the cost of 20 desks, how many can be bought for \$4410?
2. How many city lots can be made from land 250 ft. by 700 ft.?
3. A commission merchant disposed of 9800 bu. of potatoes in one month. These were sold in 140 equal lots. How many bushels were there in each lot?
4. A man had \$2000. He spent $\frac{1}{4}$ and $\frac{1}{5}$ of it. How much did he spend?
5. $22{,}540 \div 230 = ?$
6. How many square feet are there on a floor 24 ft. long and 15 ft. wide?
7. From sixty-five thousand one take six thousand five hundred fifty-two.
8. A farmer raised 1680 bu. of wheat. He sold $\frac{1}{2}$ and $\frac{1}{5}$ of it. How much had he left?
9. In a school of 960 children, $\frac{7}{16}$ are boys. How many girls are there?
10. Find the number of square yards on a blackboard 15 yd. long and $1\frac{1}{3}$ yd. wide.

## LESSON 54

### ORAL

1. How many quarts are there in $\frac{1}{2}$ bu.?
2. What is the area of a floor 7 ft. by 14 ft.?
3. If a butcher sells 3 lb. of meat for 48¢ how many pounds will 64¢ buy?
4. How many inches are there in $1\frac{1}{4}$ yd.?
5. $31 \times 3 = ?$

### WRITTEN

1. $20{,}400 \div 170 = ?$
2. How many city lots are there in land 500 ft. square?
3. Divide 168,560 by 280.
4. A farmer raised 300 bu. of corn. He sold $\frac{1}{5}$ of it to a seed dealer and $\frac{1}{8}$ of it he used. The remainder he had ground for meal. How many quarts of meal were there?
5. If 1800 tons is the weight carried in 45 coal cars how many cars will be needed to carry 2640 tons?
6. What is the area of a lot 80 ft. long and 30 ft. wide?
7. Add ninety thousand three; nine hundred three; five hundred thousand thirty; thirty thousand eight hundred.
8. A man bought 1600 acres of woodland. He sold $\frac{1}{8}$ and $\frac{1}{2}$ of it. How many acres were sold?
9. A dealer had 2560 bu. of potatoes. He sold $\frac{3}{5}$ of them. How many bushels had he left?
10. What will it cost to pave a street 1260 ft. long and 32 ft. wide at $\$1\frac{1}{4}$ a square yard?

## LESSON 55

### ORAL

1. A bin holds 60 pk. How many bushels is that?
2. How many quarts are there in 9 pk.?
3. A basket holds $1\frac{1}{2}$ bu. How many quarts does it hold?
4. A strip of linoleum 12 ft. long and 6 ft. wide contains how many square yards?
5. Take the sum of 11 and 25 from 50.

### WRITTEN

1. Change 4896 pk. to bushels.
2. How many pecks are there in 8648 qt.?
3. Change 18 bu. to quarts.
4. How many pints are there in 96 qt.?
5. Change 2720 qt. to bushels.
6. A train traveled $86\frac{4}{5}$ mi. to the first stop, then $26\frac{5}{12}$ mi., and then $37\frac{7}{8}$ mi. What was the length of its run?
7. The combined weight of 3 men is 500 lb. The first weighs $119\frac{7}{8}$ lb., the second $187\frac{5}{16}$ lb. What is the weight of the third?
8. What will it cost to plaster a wall 49 ft. long and 27 ft. wide at 47¢ a square yard?
9. What will it cost to finish a floor 52 ft. long and 45 ft. wide at $.49 a square yard?
10. Multiply 96 by $1\frac{1}{6}$.

## LESSON 56

### ORAL

1. How many quarts are there in $\frac{3}{4}$ bu.?
2. Change 96 qt. to bushels.
3. Multiply 48 by $1\frac{1}{8}$.
4. At 5¢ a quart, what will 2 pk. of potatoes cost?
5. What is the area of a board 12 ft. long and $\frac{3}{4}$ ft. wide?

### WRITTEN

1. Change 28 bu. to quarts.
2. How many bushels are there in 6848 qt.?
3. What is the cost of 46 pk. of potatoes at 11¢ per quart?
4. Apples are $\$1\frac{1}{4}$ per bushel. What is the cost of 964 bu.?
5. What will 208 pk. of apples cost at 19¢ a quart?
6. Potatoes are 25¢ a peck. Find the cost of 208 qt.
7. A merchant had $68\frac{5}{8}$ yd. of silk ribbon and $47\frac{3}{4}$ yd. of satin ribbon. He has sold $89\frac{2}{3}$ yd. in all. How many yards has he left?
8. What will it cost at \$1.10 a square yard to cover a floor 24 ft. by 21 ft. with oilcloth?
9. $36{,}492 + 28{,}756 + 9835 + 76{,}392 + 6889 = ?$
10. I have bought at different times $16\frac{3}{4}$ yd., $18\frac{7}{8}$ yd., $26\frac{1}{2}$ yd., and $16\frac{2}{3}$ yd. How many yards have I bought in all?

## REVIEW XIV

1. A clothing dealer's bill for 78 suits was \$1170. Another dealer bought 42 suits of the same kind. What was his bill?

2. At 35¢ a peck, how much will I have to pay for $1\frac{1}{2}$ bu. of potatoes?

3. How many inches of moulding will it take for a picture frame if the two long sides are each $12\frac{3}{8}$ in., and the short sides are each $7\frac{1}{4}$ in.?

4. A grocer bought 3 tubs of butter containing $64\frac{1}{2}$ lb., $59\frac{1}{4}$ lb., and $61\frac{1}{4}$ lb. What did it all cost him at 28¢ a pound?

5. A contractor laid a sidewalk 5 ft. wide on both sides of a street half a mile long. If he contracted to do the work for 17¢ a square foot, what was the amount of the contract? Draw a diagram.

6. A huckster bought 24 bu. of potatoes for \$21.60 and sold them at 8¢ a quart. Find his gain.

7. Into how many lots, each 25 ft. by 100 ft., can a piece of land 1000 ft. by 300 ft. be cut?

8. A man with an income of \$1380 pays $\frac{1}{5}$ of it for rent, $\frac{1}{3}$ of it for food, $\frac{1}{4}$ of it for clothes, and $\frac{1}{10}$ of it for miscellaneous expenses. How much does he save?

9. How many more pecks are there in a bin holding 48 bu. than in one holding 1528 qt.?

10. A vender bought a half-bushel of peanuts at \$3 a bushel. He sold them at 5¢ a pint. Find his gain.

## DIVISION DRILL

### *A*

1. 234)1,718,028
2. 456)1,689,480
3. 687)1,013,325
4. 915)2,184,105
5. 951)2,184,105
6. 951)4,713,156
7. 519)1,484,859
8. 432)2,241,648
9. 564)2,306,196
10. 868)2,240,308
11. 284)1,095,956
12. 824)3,849,728
13. 863)7,209,502
14. 324)3,164,832
15. 654)6,286,248
16. 786)2,901,912
17. 736)2,816,672
18. 637)3,799,068
19. 953)6,180,205

### *B*

1. 345)550,965
2. 576)1,767,744
3. 798)5,253,234
4. 364)3,375,372
5. 675)1,748,925
6. 467)4,379,526
7. 453)1,297,392
8. 756)1,820,448
9. 978)7,327,176
10. 459)4,105,755
11. 789)4,689,027
12. 583)2,210,736
13. 534)2,021,724
14. 675)4,735,125
15. 897)4,661,709
16. 573)3,998,394
17. 386)3,073,718
18. 659)3,870,966
19. 278)2,278,766

### *C*

1. 876)7,858,596
2. 649)1,166,902
3. 248)2,053,192
4. 847)7,012,313
5. 567)4,495,176
6. 387)3,785,634
7. 962)2,864,836
8. 792)5,780,016
9. 358)1,424,124
10. 945)8,445,465
11. 682)5,045,436
12. 489)4,783,887
13. 274)1,040,652
14. 854)8,008,812
15. 469)4,571,812
16. 165)1,311,420
17. 783)6,639,057
18. 576)2,820,672
19. 378)3,324,132

## LESSON 57

*Teach that 4 gi. = 1 pt.*

### ORAL

1. How many gills are there in 11 pt.?
2. What will 2 gal. of oil cost at 12¢ a quart?
3. Change 18 bu. to pecks.
4. How many quarts are there in $1\frac{1}{4}$ bu.?
5. $2\frac{1}{3} + 6\frac{2}{3} = ?$

### WRITTEN

1. Change 48 pt. to gills.
2. What is the cost of 9 gal. of cream at $.35 per quart?
3. What is the cost of 56 qt. of gasoline at $.17 per gallon?
4. From a quart of cream, Mrs. Gray filled ice cream cones, using a gill to a cone. How many cones did she fill?
5. Change 460 gi. to pints.
6. At $.56 a peck, what is the cost of $1\frac{1}{2}$ bu. of potatoes?
7. A farmer had 864 qt. of apples. How many bushels had he?
8. $12\frac{1}{2} + 8\frac{1}{3} + 6\frac{7}{10} + 11\frac{8}{15} = ?$
9. Write in Roman numerals 997, 764, 802.
10. $486{,}932 \div 596 = ?$

## LESSON 58

### ORAL

1. How many pint bottles are needed to hold 20 qt. of milk?

2. A gallon of machine oil was put into quart bottles and sold at 25¢ a bottle. What was received for it?

3. Take the sum of $2\frac{1}{2}$ and $3\frac{1}{2}$ from 15.

4. $25 \times 1\frac{1}{5} = ?$

5. $19 \times 4 = ?$

### WRITTEN

1. Find the cost of 5 quart bottles of dye at $.75 per pint.

2. A druggist buys for $.75 a gallon of liniment, which he retails at 5¢ a gill. What is his gain?

3. How many quarts are there in 492 gal.?

4. Change 3808 pt. to gallons.

5. Find the cost of 6 gal. of vinegar at 8¢ per quart.

6. Add $38\frac{1}{8}$, $147\frac{2}{3}$, $362\frac{3}{4}$, $99\frac{1}{6}$.

7. Subtract the sum of $139\frac{1}{5}$ and $247\frac{3}{4}$ from 640.

8. In an automobile race the distance traveled was $69\frac{4}{7}$ mi. in the first hour, $75\frac{3}{8}$ mi. the second, and $74\frac{1}{4}$ mi. the third. How many miles were covered in the three hours?

9. Divide 71,760 by 345 and multiply the quotient by 208.

10. There were 100 yd. of muslin in a bolt. The salesman sold $36\frac{3}{4}$ yd. and $42\frac{5}{8}$ yd. to two customers. How many yards were left?

## LESSON 59

### ORAL

1. How many feet are there in 27 yd.?
2. How many rods are there in a mile?
3. Change $\frac{1}{2}$ yd. to inches.
4. What is a peck of onions worth at 9¢ a quart?
5. 37 qt. is how many pints?

### WRITTEN

1. Frank jumped 3 yd. George jumped 100 in. Which jumped the further and how much?
2. Change 52,480 rd. to miles.
3. How many yards are there in 590 mi.?
4. How many feet are there in 6 times 24 yd.?
5. Change to inches and add $\frac{1}{2}$ yd., 17 yd., $1\frac{1}{4}$ yd.
6. Add $56\frac{1}{3}$, $7\frac{11}{30}$, and $15\frac{2}{15}$.
7. $765\frac{1}{3} - 596\frac{7}{8} = ?$
8. 13 pk. of potatoes were sold at \$.14 a quart. How much money was received?
9. A man bought 164 qt. of vinegar for \$10, and sold it at \$.03 per pint. Did he gain or lose?
10. How many city lots can be made from land 200 ft. by 100 ft.? Make a diagram.

## LESSON 60

### ORAL

1. How many inches are there in $1\frac{1}{6}$ yd.?
2. Change 29 yd. to feet.
3. $40 \times 1\frac{1}{4} = ?$
4. How many bottles, each holding one gill, can be filled from 15 pt.?
5. A sheet of paper 3 in. wide contains 12 sq.in. How long is the paper?

### WRITTEN

1. Change 203 yd. to inches.
2. At $1\frac{1}{2}$¢ a foot, what will 108 yd. of barbed wire fencing cost?
3. How many inches are there in 6238 yd.?
4. It requires 105 ft. of gilt moulding for a room. How much will it cost at $.96 a yard?
5. Change $1\frac{1}{4}$ mi. to feet.
6. From a piece of cambric containing $65\frac{3}{8}$ yd., there were sold $20\frac{1}{4}$ yd. and $17\frac{5}{8}$ yd. How many yards were left?
7. Charles can do some work in $12\frac{2}{3}$ days. William can do it in $1\frac{2}{3}$ days less. In what time can William do it?
8. 16,844 pk. = how many bushels?
9. What is the cost of 168 pt. of lime water at $1\frac{1}{2}$¢ per gill?
10. One side of a rectangle is 114 in., the other side is 17 in. What is the area?

## REVIEW XV

1. How many cones can be filled from $1\frac{1}{2}$ gal. of cream, if a gill is put into each cone?

2. Divide 212,952 by 467.

3. Add $19\frac{6}{7}$, $23\frac{5}{6}$, and $47\frac{2}{3}$.

4. From $93\frac{1}{8}$ take $37\frac{4}{5}$.

5. Subtract $18\frac{3}{4}$ from 100.

6. What will be received for 8 bu. of potatoes at 5¢ a quart?

7. Change 6080 rd. to miles.

8. How many square yards are there on a floor 21 ft. by 18 ft.?

9. Change 10 gal. to gills.

10. 30 gal. of maple syrup were put into pint cans and sold at 25¢ a can. What was received?

## RAPID FACTOR DRILL

*Without copying the figures, write as many answers as possible to the following drills in the time allowed. Start and stop at the teacher's signal. Write for 5 minutes. Score 5 for each correct answer. Keep results. Compare with successive trials. Note improvement in* **speed** *and* **accuracy**.

### *A*

| | | | |
|---|---|---|---|
| ?)98 | $4 \times ? = 72$ | $? \div 18 = 5$ | $? \div 6 = 15$ |
| 7 | 19)? | $22 \times ? = 88$ | $\frac{1}{25}$ of $? = 4$ |
| $\frac{1}{4}$ of $52 = ?$ | 4 | $60 \div 15 = ?$ | 4)56 |
| $? \times 25 = 75$ | $72 \div ? = 18$ | $5 \times ? = 90$ | ? |
| 3)99 | $? \times 4 = 60$ | $? \div 13 = 5$ | $64 \div ? = 4$ |
| ? | $\frac{1}{3}$ of $? = 23$ | ?)84 | $? \times 7 = 98$ |
| $7 \times 14 = ?$ | $63 \div 21 = ?$ | 21 | |

### *B*

| | | | |
|---|---|---|---|
| $88 \div 22 = ?$ | 15)? | 25)? | $? \div 23 = 4$ |
| 28)? | 4 | 4 | 4)80 |
| 3 | $78 \div 6 = ?$ | $? \div 20 = 4$ | ? |
| ?)84 | $? \times 5 = 70$ | $66 \div 33 = ?$ | $100 \div 25 = ?$ |
| 14 | 23)92 | $3 \times 27 = ?$ | 13)? |
| $? \div 33 = 3$ | ? | $56 \div ? = 4$ | 6 |
| $\frac{1}{20}$ of $80 = ?$ | $\frac{1}{6}$ of $90 = ?$ | $\frac{1}{13}$ of $91 = ?$ | $\frac{1}{15}$ of $75 = ?$ |

### *C*

| | | | |
|---|---|---|---|
| $? \div 33 = 2$ | $100 \div 25 = ?$ | $? \div 13 = 4$ | ?)75 |
| ?)81 | $? \times 13 = 65$ | 16)80 | 15 |
| 27 | $\frac{1}{14}$ of $84 = ?$ | ? | $? \times 6 = 78$ |
| ?)88 | $68 \div 4 = ?$ | $\frac{1}{5}$ of $95 = ?$ | $91 \div 7 = ?$ |
| 22 | 24)72 | $84 \div 4 = ?$ | $\frac{1}{16}$ of $64 = ?$ |
| 22)? | ? | ?)100 | $\frac{1}{21}$ of $63 = ?$ |
| 3 | $14 \times ? = 56$ | 5 | |

## RAPID FACTOR DRILL—*Continued*

### *D*

$25)\underline{?}$
$3$

$70 \div 5 = ?$

$3 \times ? = 87$

$81 \div 3 = ?$

$?)\underline{93}$
$31$

$15)\underline{?}$
$6$

$? \times 31 = 93$

$30 \times ? = 90$

$? \div 3 = 22$

$\frac{1}{3}$ of $78 = ?$

$84 \div 3 = ?$

$? \times 23 = 92$

$? \div 29 = 3$

$5)\underline{65}$
$?$

$24)\underline{?}$
$4$

$? \div 4 = 19$

$3)\underline{90}$
$?$

$5)\underline{?}$
$14$

$\frac{1}{21}$ of $? = 4$

### *E*

$33 \times ? = 99$

$\frac{1}{14}$ of $96 = ?$

$13)\underline{52}$
$?$

$96 \div ? = 3$

$85 \div 5 = ?$

$13)\underline{?}$
$7$

$98 \div ? = 14$

$80 \div 16 = ?$

$?)\underline{96}$
$3$

$3)\underline{87}$
$?$

$93 \div ? = 31$

$18)\underline{72}$
$?$

$4)\underline{64}$
$?$

$16)\underline{?}$
$6$

$84 \div 14 = ?$

$20 \times 5 = ?$

$17)\underline{?}$
$4$

$?)\underline{69}$
$3$

$3 \times ? = 84$

$? \div 4 = 24$

$?)\underline{80}$
$5$

$?)\underline{95}$
$19$

$? \times 19 = 76$

$? \div 5 = 15$

$95 \div 5 = ?$

$16 \times ? = 96$

$\frac{1}{5}$ of $80 = ?$

$? \times 17 = 85$

## REVIEW E

1. A room is 18 ft. square. How many square yards are there on the ceiling?

2. There are 966 pupils in a school. $\frac{4}{7}$ of them are girls. Find the number of girls.

3. How long will 12 bu. of potatoes last a family, if it uses 3 qt. a day?

4. If 13 yd. cost \$6.24, what will $\frac{3}{4}$ of a yard cost?

5. Into how many square inches can a piece of paper 2 ft. long and 8 in. wide be cut?

6. How much will 40 ft. of gold wire cost at 2¢ an inch?

7. When potatoes are 30¢ a peck, how much will $2\frac{1}{2}$ bu. cost?

8. What will 15 doz. baseballs cost at \$1.25 each?

9. Divide 289,301 by 659.

10. $79\frac{6}{7}+58\frac{4}{5}+84\frac{1}{2}=?$

11. What will it cost to travel 78 mi. at $1\frac{1}{2}$¢ a mile?

12. How many more square inches are there in a piece of paper 18 in. by 30 in., than in one 2 ft. long and 22 in. wide?

13. A field is 132 ft. long and $\frac{1}{3}$ as wide. How many square feet does it contain?

14. How many 10-gallon cans of milk are needed to supply 96 customers, if each one takes a quart?

15. A foreman receives \$4.50 a day and each of 12 workmen $\frac{4}{5}$ as much. What is the payroll for a week for the foreman and the men?

## REVIEW E—*Continued*

16. A boy sold 30 doz. eggs. For 18 doz. he received 24¢ a dozen; for 6 doz., 22¢; and for the rest, 20¢. How much did he receive?

17. How much sugar at 6¢ a pound can you get for 18 doz. eggs valued at 24¢ a dozen?

18. If a man earns $125 a month and spends $116.25, how much can he save in 3 yr.?

19. A lady bought 8 yd. of silk for $6.72. If she buys 5 yd. more, what will it all cost?

20. At 25¢ a dozen, what will it cost to supply 2 pencils each to 336 pupils?

21. I sold land for $5750, gaining $375. How much would I have gained or lost if I had sold it for $5525?

22. A. earned $36 in a week. This was 8 times as much as B. earned. How much did both earn?

23. A man earning $180 a month is able to save $\frac{1}{9}$ of it. How much can he save in 5 yr.?

24. I bought a set of books for $56 on instalments, paying $5 cash. If I pay $3 a month, how long will it take me to pay for it?

25. A man bought 84 sheep at $5 a head. He sold $\frac{4}{7}$ of them at $6 a head and the remainder at $5.75. Find his gain.

26. A dealer received a bill of $1320 for 55 automobile tires. What was the price of each tire?

27. How many square yards of oilcloth are required to cover a floor 21 ft. by 18 ft.?

## REVIEW E—*Continued*

28. Find the cost of 324 books at $2.75 each.

29. From sixty-one thousand eleven take forty-nine thousand five hundred forty-three.

30. A farmer sold 44 bbl. of potatoes for $99. How much more would he have received, if he had sold them at $2.50 a barrel?

31. If a stationer buys 142 blank books at 3¢ each and sells them at 5¢, how much does he gain?

32. How many tiles each a foot square will it take for a hall 25 ft. long and 15 ft. wide?

33. To what number must 37,698 be added to make 71,401?

34. What is the value of 39 bales of cotton, each weighing 487 lb. at 12¢ a pound?

35. 75 street cars carried 54,000 passengers in a day. If each car made 10 trips, what was the average number carried by each car on each trip?

36. It cost $236,580 to construct 12 miles of railroad. What was the average cost per mile?

37. A real estate dealer paid $4875 for land, at $75 an acre. He sold a part of it for $2550, at $85 an acre. How many acres had he left?

38. A farm of 160 acres produces 45 bu. of corn to the acre. The whole crop is sold at 56¢ a bushel. What is received for it?

39. John has 64¢ and James has $\frac{3}{4}$ as much. William has $\frac{1}{8}$ as much as both. How much have they all?

## REVIEW E—*Continued*

40. $16\frac{2}{3}+15\frac{3}{4}+29\frac{5}{6}-38\frac{1}{2}=?$

41. Add forty thousand three; ninety thousand nine hundred; seven hundred two thousand twenty; eighteen thousand seventy-nine.

42. What will be received for 10 gal. of milk at 3¢ a pint?

43. Add $\frac{1}{2}$ yd., $2\frac{3}{4}$ ft., and 7 in.

44. Write in Roman numerals 944, 871, 980, 791, 555.

45. A pole is 78 ft. long. $\frac{1}{6}$ of it is in the ground. How high does it extend above the ground?

46. Divide $54\times42$ by $108\times21$.

47. Multiply 640 by 60.

48. Divide 530,100 by 190.

49. Add $\frac{9}{16}$ of 496 and $\frac{7}{12}$ of 504.

50. The cyclometer of a bicycle in the morning registered $487\frac{7}{10}$ miles and in the evening $561\frac{1}{10}$ mi. What was the day's run?

51. At $1.28 a word, what will it cost to send a cablegram of 27 words?

## FRACTION DRILL IV

### Addition or Subtraction

*Work problems mentally, if possible—write answers only*

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| $3\frac{3}{4}$ | $4\frac{5}{6}$ | $5\frac{7}{8}$ | $7\frac{1}{2}$ | $4\frac{1}{2}$ | $2\frac{5}{8}$ |
| $1\frac{1}{2}$ | $3\frac{1}{2}$ | $3\frac{3}{4}$ | $2\frac{3}{8}$ | $2\frac{1}{4}$ | $1\frac{1}{2}$ |
| 12 | $6\frac{1}{2}$ | $5\frac{3}{4}$ | $6\frac{7}{8}$ | $4\frac{3}{4}$ | $5\frac{3}{4}$ |
| $3\frac{1}{2}$ | $2\frac{1}{8}$ | $2\frac{3}{8}$ | $5\frac{5}{8}$ | $3\frac{1}{4}$ | $2\frac{1}{8}$ |
| $9\frac{7}{8}$ | $7\frac{5}{8}$ | $9\frac{7}{8}$ | $8\frac{5}{8}$ | $7\frac{1}{2}$ | $6\frac{5}{8}$ |
| $4\frac{1}{2}$ | $2\frac{3}{8}$ | $2\frac{1}{4}$ | $7\frac{1}{4}$ | $5\frac{1}{4}$ | $3\frac{1}{8}$ |
| $5\frac{3}{4}$ | $4\frac{3}{8}$ | $7\frac{1}{4}$ | $12\frac{7}{8}$ | $4\frac{5}{8}$ | $9\frac{1}{12}$ |
| $2\frac{5}{8}$ | $1\frac{1}{4}$ | $3\frac{1}{8}$ | $10\frac{1}{3}$ | $3\frac{1}{6}$ | $6\frac{1}{4}$ |
| $8\frac{5}{6}$ | $5\frac{2}{3}$ | $7\frac{7}{12}$ | $6\frac{5}{12}$ | $4\frac{1}{3}$ | $5\frac{1}{2}$ |
| $2\frac{1}{3}$ | $3\frac{1}{2}$ | $5\frac{1}{4}$ | $2\frac{1}{6}$ | $3\frac{1}{4}$ | $2\frac{1}{3}$ |
| $6\frac{3}{4}$ | $4\frac{5}{6}$ | $4\frac{1}{2}$ | $7\frac{3}{8}$ | $9\frac{7}{8}$ | $5\frac{3}{4}$ |
| $5\frac{1}{3}$ | $1\frac{1}{7}$ | $3\frac{1}{6}$ | $5\frac{1}{3}$ | $7\frac{1}{6}$ | $2\frac{2}{3}$ |
| $7\frac{5}{8}$ | $6\frac{1}{2}$ | $9\frac{3}{8}$ | $6\frac{7}{8}$ | $5\frac{1}{2}$ | $6\frac{5}{6}$ |
| $1\frac{1}{3}$ | $5\frac{1}{7}$ | $7\frac{1}{6}$ | $4\frac{7}{9}$ | $3\frac{2}{5}$ | $3\frac{3}{4}$ |
| $8\frac{11}{12}$ | $5\frac{2}{3}$ | $5\frac{1}{3}$ | $4\frac{5}{6}$ | $5\frac{2}{3}$ | $6\frac{7}{8}$ |
| $7\frac{2}{3}$ | $1\frac{1}{4}$ | $3\frac{1}{6}$ | $2\frac{2}{3}$ | $1\frac{1}{6}$ | $2\frac{5}{6}$ |

## FRACTION DRILL V

### SUBTRACTION

*Work problems mentally—write answers only*

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| $5\frac{1}{4}$ | $8\frac{1}{2}$ | $4\frac{1}{8}$ | $5\frac{3}{8}$ | $6\frac{5}{8}$ | $8\frac{1}{2}$ |
| $3\frac{1}{2}$ | $6\frac{3}{4}$ | $2\frac{1}{2}$ | $3\frac{1}{2}$ | $4\frac{7}{8}$ | $4\frac{5}{8}$ |
| $5\frac{1}{8}$ | $6\frac{1}{4}$ | $10\frac{3}{8}$ | $7\frac{1}{2}$ | $8\frac{3}{4}$ | $6\frac{5}{8}$ |
| $3\frac{7}{8}$ | $4\frac{1}{2}$ | $5\frac{5}{8}$ | $5\frac{7}{8}$ | $2\frac{7}{8}$ | $6\frac{3}{4}$ |
| $7\frac{3}{8}$ | $5\frac{1}{2}$ | $8\frac{3}{16}$ | $5\frac{1}{6}$ | $7\frac{1}{3}$ | $8\frac{1}{9}$ |
| $3\frac{3}{4}$ | $1\frac{3}{4}$ | $3\frac{1}{2}$ | $3\frac{3}{8}$ | $4\frac{5}{8}$ | $6\frac{2}{3}$ |
| $7\frac{1}{2}$ | $8\frac{1}{8}$ | $9\frac{3}{16}$ | $4\frac{1}{8}$ | $6\frac{1}{4}$ | $8\frac{3}{8}$ |
| $5\frac{9}{16}$ | $6\frac{1}{6}$ | $5\frac{3}{4}$ | $1\frac{1}{4}$ | $3\frac{3}{8}$ | $6\frac{7}{8}$ |
| $5\frac{1}{2}$ | $6\frac{2}{3}$ | $7\frac{1}{10}$ | $3\frac{1}{2}$ | $7\frac{1}{4}$ | $9\frac{9}{16}$ |
| $4\frac{7}{12}$ | $1\frac{5}{6}$ | $5\frac{4}{5}$ | $2\frac{9}{10}$ | $5\frac{2}{3}$ | $4\frac{5}{6}$ |
| $6\frac{1}{8}$ | $7\frac{1}{12}$ | $8\frac{1}{3}$ | $9\frac{1}{4}$ | $8\frac{1}{2}$ | $7\frac{1}{3}$ |
| $4\frac{1}{3}$ | $5\frac{5}{6}$ | $6\frac{2}{3}$ | $7\frac{5}{6}$ | $6\frac{2}{3}$ | $5\frac{1}{2}$ |

## FRACTION DRILL VI

| | | |
|---|---|---|
| $\frac{3}{4}$ of 64 = ? | $\frac{7}{8}$ of 72 = ? | $\frac{2}{3}$ of 60 = ? |
| $\frac{7}{8}$ of 96 = ? | $\frac{1}{2}$ of 36 = ? | $\frac{3}{4}$ of 48 = ? |
| $\frac{3}{5}$ of 80 = ? | $\frac{3}{4}$ of 60 = ? | $\frac{1}{2}$ of 96 = ? |
| $\frac{2}{3}$ of 48 = ? | $\frac{6}{7}$ of 84 = ? | $\frac{9}{10}$ of 50 = ? |
| $\frac{1}{2}$ of 54 = ? | $\frac{3}{8}$ of 24 = ? | $\frac{4}{5}$ of 60 = ? |
| $\frac{8}{9}$ of 63 = ? | $\frac{5}{6}$ of 36 = ? | $\frac{6}{7}$ of 42 = ? |
| $\frac{3}{8}$ of 32 = ? | $\frac{3}{16}$ of 64 = ? | $\frac{5}{12}$ of 96 = ? |
| $\frac{3}{4}$ of 96 = ? | $\frac{2}{3}$ of 27 = ? | $\frac{2}{5}$ of 30 = ? |
| $\frac{5}{6}$ of 48 = ? | $\frac{5}{7}$ of 35 = ? | $\frac{7}{9}$ of 45 = ? |
| $\frac{5}{8}$ of 56 = ? | $\frac{7}{10}$ of 80 = ? | $\frac{2}{3}$ of 24 = ? |
| $\frac{3}{4}$ of 36 = ? | $\frac{2}{5}$ of 40 = ? | $\frac{5}{6}$ of 72 = ? |
| $\frac{7}{8}$ of 56 = ? | $\frac{8}{9}$ of 54 = ? | $\frac{3}{4}$ of 24 = ? |

# TABLES

## LONG MEASURE

| | |
|---|---|
| 12 inches = 1 foot | 12 in. = 1 ft. |
| 3 feet = 1 yard | 3 ft. = 1 yd. |
| 5280 feet = 1 mile | 5280 ft. = 1 mi. |
| 1760 yards = 1 mile | |
| 320 rods = 1 mile | 320 rd. = 1 mi. |
| 36 inches = 1 yard | |

## LIQUID MEASURE

| | |
|---|---|
| 4 gills = 1 pint | 4 gi. = 1 pt. |
| 2 pints = 1 quart | 2 pt. = 1 qt. |
| 4 quarts = 1 gallon | 4 qt. = 1 gal. |
| $31\frac{1}{2}$ gallons = 1 barrel | $31\frac{1}{2}$ gal. = 1 bbl. |

## DRY MEASURE

| | |
|---|---|
| 2 pints = 1 quart | 2 pt. = 1 qt. |
| 8 quarts = 1 peck | 8 qt. = 1 pk. |
| 4 pecks = 1 bushel | 4 pk. = 1 bu. |

## AVOIRDUPOIS WEIGHT

| | |
|---|---|
| 16 ounces = 1 pound | 16 oz. = 1 lb. |
| 2000 pounds = 1 ton | 2000 lb. = 1 T. |

## TIME MEASURE

| | |
|---|---|
| 60 seconds = 1 minute | 60 sec. = 1 min. |
| 60 minutes = 1 hour | 60 min. = 1 hr. |
| 24 hours = 1 day | 24 hr. = 1 da. |
| 7 days = 1 week | 7 da. = 1 wk. |
| 52 weeks = 1 year | 52 wk. = 1 yr. |
| 12 months = 1 year | 12 mo. = 1 yr. |
| 365 days = 1 year (common) | 365 da. = 1 yr. |
| 366 days = 1 leap year | |
| 28–31 days = 1 month | |

## COUNTING

| | |
|---|---|
| 12 things = 1 dozen | 12 = 1 doz. |
| 12 dozen = 1 gross | 12 doz. = 1 gr. |

## SQUARE MEASURE

| | |
|---|---|
| 144 square inches = 1 square foot | 144 sq. in. = 1 sq. ft. |
| 9 square feet = 1 square yard | 9 sq. ft. = 1 sq. yd. |

## ROMAN NUMBERS

| | | | |
|---|---|---|---|
| 1. I | 13. XIII | 49. XLIX | 110. CX |
| 2. II | 14. XIV | 50. L | 200. CC |
| 3. III | 15. XV | 51. LI | 300. CCC |
| 4. IV | 16. XVI | 55. LV | 400. CD |
| 5. V | 19. XIX | 59. LIX | 500. D |
| 6. VI | 20. XX | 60. LX | 800. DCCC |
| 7. VII | 21. XXI | 70. LXX | 900. CM |
| 8. VIII | 30. XXX | 80. LXXX | 1000. M |
| 9. IX | 31. XXXI | 90. XC | 1200. MCC |
| 10. X | 35. XXXV | 99. XCIX | 1900. MCM |
| 11. XI | 39. XXXIX | 100. C | |
| 12. XII | 40. XL | 101. CI | |

# TYPES FROM FOURTH YEAR—FIRST HALF

## TYPE I

### LONG DIVISION

(*a*) When the divisor is contained as many times in the partial dividend as the first figure of the divisor is contained in the first figure of the dividend.

1. $441 \div 21 = ?$

$$\begin{array}{r} 21 \\ 21\overline{)441} \\ 42 \\ \hline 21 \\ 21 \\ \hline \end{array}$$

Partial division:

(*A*)
$$\begin{array}{r} 2 \\ 2\overline{)4} \end{array}$$
2 is contained in 4 two times.

(*B*)
$$\begin{array}{r} 2 \\ 21\overline{)44} \\ 42 \\ \hline 2 \end{array}$$
21 is contained in 44 two times, with 2 remainder. Bring down the next figure of the dividend, making 21 the next partial dividend.

(*C*)
$$\begin{array}{r} 1 \\ 21\overline{)21} \\ 21 \\ \hline \end{array}$$
21 is contained in 21 one time.

2. $651 \div 21 = ?$
3. $462 \div 22 = ?$
4. $682 \div 22 = ?$
5. $861 \div 21 = ?$
6. $672 \div 21 = ?$
7. $286 \div 22 = ?$
8. $294 \div 21 = ?$

## TYPE I—*Continued*

(*b*) When the first partial dividend contains two figures.

**9.** $1323 \div 21 = ?$

$$\begin{array}{r} 6 \\ 2\overline{)13} \\ \end{array}$$

2 is not contained in 1, so the first partial dividend is 13. $13 \div 2 = 6$.

$$\begin{array}{r} 6 \\ 21\overline{)132} \\ 126 \\ \hline 6 \end{array}$$

$132 \div 21 = 6$.

Continue the division as in Type I.

$$\begin{array}{r} 63 \\ 21\overline{)1323} \\ 126 \\ \hline 63 \\ 63 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ 21\overline{)63} \\ 63 \\ \hline \end{array}$$

**10.** Divide 1554 by 21.

**11.** $1166 \div 22 = ?$

**12.** $1281 \div 21 = ?$

**13.** $1782 \div 22 = ?$

**14.** $1953 \div 21 = ?$

**15.** $1188 \div 22 = ?$

## TYPE II

### DIVISION WITH ZERO IN THE QUOTIENT

**1.** Divide 8568 by 21.

$$21\overline{)8568} = 408$$

$$84$$

$$168$$

$$168$$

Partial divisions:

$$21\overline{)85} = 4$$

$$84$$

1 remainder

21 is contained in 85 four times with a remainder of 1.

$$21\overline{)16} = 0 \text{ remainder}$$

The next partial dividend is 16. 21 is not contained in 16 so the next quotient figure is 0.

$$21\overline{)168} = 8$$

$$168$$

The next partial dividend is 168. 21 is contained in 168 eight times.

2. $6710 \div 22 = ?$
3. $6426 \div 21 = ?$
4. $2288 \div 22 = ?$
5. $8505 \div 21 = ?$
6. $2398 \div 22 = ?$
7. $8463 \div 21 = ?$
8. $4347 \div 21 = ?$
9. $8976 \div 22 = ?$
10. $2268 \div 21 = ?$

## TYPE III

### WHEN THE MULTIPLIER ENDS IN 0

1. $234 \times 30 = ?$

In multiplying by any number ending in 0 place the multiplier under the multiplicand with the 0 to the right of the last figure of the multiplicand.

$$\begin{array}{r} 234 \\ \times 30 \\ \hline \end{array}$$

Write the 0 as the last figure of the product and proceed to multiply by 3.

$$\begin{array}{r} 234 \\ \times 30 \\ \hline 7020 \end{array} \quad \textit{Ans.}$$

2. $128 \times 240 = ?$

$$\begin{array}{r} 128 \\ 240 \\ \hline 5120 \\ 256 \\ \hline 30720 \end{array} \quad \textit{Ans.}$$

3. $436 \times 20 = ?$
4. $715 \times 40 = ?$
5. $98 \times 120 = ?$
6. $81 \times 320 = ?$
7. $597 \times 160 = ?$
8. $349 \times 270 = ?$
9. $276 \times 890 = ?$
10. $854 \times 540 = ?$

## TYPE IV

### DIVISION

*Where the divisor is* **not** *contained as many times in the partial dividend as the* **first figure** *of the divisor is contained in the first figure or the first two figures of the partial dividend.*

1. Divide 6116 by 22.

2 is contained in 6 three times.

$3 \times 22 = 66$.

66 is more than 61, therefore 22 is not contained 3 times in 61.

$2 \times 22 = 44$, therefore 22 is contained in 61 two times with a remainder of 17.

The next partial dividend is 171. 2 is contained in 17 eight times. $8 \times 22 = 176$.

176 is more than 171, therefore 22 is not contained 8 times in 171.

$7 \times 22 = 154$, which is less than 171. Therefore 22 is contained in 171 seven times with a remainder of 17.

When the divisor is not contained as many times as the trial figure, take the next smaller number for the quotient figure.

```
  2
22)61
  44
  --
  17

   7
22)171
  154
  ---
   17

  278
22)6116
  44
  ---
  171
  154
  ---
   176
   176
   ---
```

2. $6048 \div 32 = ?$
3. $8274 \div 42 = ?$
4. $8118 \div 41 = ?$
5. $7008 \div 24 = ?$

*Sometimes it is necessary to make more than one trial before the quotient figure can be found, as in dividing 15 into 435. 1 is contained four times in 4 but 15 is contained in 43 two times.*

## TYPE V

### TO FIND THE COST OF MORE THAN ONE. MULTIPLICATION OF DOLLARS AND CENTS

1. At \$4.15 each, what will 125 books cost?

\$4.15 = cost of 1.
×125
2075
830
415
\$518.75 = cost of all.

When the multiplicand contains dollars and cents place a point in the product before the last two figures to separate dollars and cents.

2. What is the cost of 12 dresses at \$4.72 each?
3. At \$3.57 each what will 142 tables cost?
4. If 1 desk cost \$13.14, what will 170 cost?
5. What must be paid for 320 rugs @ \$24.19 each?
6. At \$4.98, what will 307 dresses cost?
7. Find the cost of 16 chairs @ \$4.65 each.
8. One rug costs \$2.15. What will 450 rugs cost.
9. Find the cost of 212 coats at \$9.98 each.
10. A tailor bought 105 yd. of cloth @ \$3.49 each. Find the cost.

## TYPE VI

### DIVISION BY 19, 29, 39, 49, ETC.

When a divisor of two figures ends in 9 use the next higher number of tens than that given for the trial divisor.

e.g. divisor 19, use 20 for the *trial* divisor;
" 29, " 30 " " " " ;
" 39, " 40 " " " " etc.

1. Divide 9261 by 49.

*Trial divisor 5.*
5 is contained in 9 *once.*
49 is contained in 92 *once.*
5 is contained in 43 *eight* times.
49 is contained in 436 *eight* times.
The last quotient figure must be found by trial

$$\begin{array}{r} 189 \\ 49\overline{)9261} \\ 49 \\ \hline 436 \\ 392 \\ \hline 441 \\ 441 \\ \hline \end{array}$$

2. $7315 \div 19 = ?$
3. $7215 \div 39 = ?$
4. $9251 \div 29 = ?$
5. $8232 \div 49 = ?$
6. $9853 \div 59 = ?$
7. $9204 \div 39 = ?$
8. $7693 \div 49 = ?$
9. $8487 \div 69 = ?$

## TYPE VII

### DIVISION: DIVIDEND AND DIVISOR ENDING IN 0

1. At \$20 each how many suits of clothes can I buy for \$80?

$2\not{0})8\not{0}$

$4$ *Ans.*

Cross off the cipher in both divisor and dividend and proceed with the division, using the remaining numbers for divisor and dividend.

2. How many times is 30 contained in 150?
3. Divide 240 by 80.
4. $350 \div 50 = ?$
5. A man earns \$90 a month. How long will it take him to earn \$450?
6. $4840 \div 40 = ?$
7. $5250 \div 70 = ?$
8. $1560 \div 20 = ?$
9. $3050 \div 50 = ?$
10. $2940 \div 60 = ?$

## TYPE VIII

### TERMS IN DIVISION

In Division:—

(*A*) the number by which we divide is called the *divisor.*

(*B*) the number which is divided is called the *dividend.*

(*C*) the answer is called the *quotient.*

1. The dividend is 48, the divisor is 12. What is the quotient?

divisor dividend

12)48

4 quotient.

2. The divisor is 57, the dividend is 6612. Find the quotient.

3. How many times is the divisor 18 contained in the dividend 378?

? ?

4. ?)?

Write the names of the numbers which should be placed in the above spaces.

## TYPE IX

### MULTIPLICATION OF CENTS TO GIVE DOLLARS AND CENTS

1. Find the cost of 47 books @ \$.15 each.

\$ .15 cost of 1 book.
47
105
60
\$7.05 cost of 47 books.

Proceed as in the multiplication of dollars and cents (Lesson 12). Point off two places in the product for cents.

2. What will 16 yd. of cloth cost @ \$.98 a yard?

3. Find the cost of 12 lb. of ham @ \$.27 a pound.

4. What will I pay for 3 doz. cans of preserves @ \$.18 a can?

5. What will 45 lb. of sugar cost @ \$.06 a pound?

6. When pencils cost \$.05 each what will 4 doz. pencils cost?

7. Blank books sell for \$.12 each. What does a dealer receive for 38 blank books?

8. What is the value of 27 yd. of ribbon @ \$.19 a yard?

9. Tickets for a party of 8 persons were bought. At 59¢ each, what did they cost?

10. What will a man's wages for a week amount to, if he works 58 hours, and is paid 38¢ an hour?

## TYPE X

### SHORT PROCESS OF MULTIPLICATION BY 11 AND 12

1. Multiply 135 by 11.

$$\begin{array}{r} 135 \\ \times 11 \\ \hline 1485 \end{array}$$ *Ans.*

Multiply each figure of the multiplicand by 11. Place the last figure of the partial product in the answer and carry the other figures as in multiplication by a single figure.

2. Multiply 247 by 12.

$$\begin{array}{r} 247 \\ \times 12 \\ \hline 2964 \end{array}$$ *Ans.*

Work as in example 1.

3. $548 \times 12 = ?$
4. $695 \times 11 = ?$
5. $309 \times 12 = ?$
6. $577 \times 12 = ?$
7. $9563 \times 11 = ?$
8. $4065 \times 12 = ?$

## TYPE XI

### DIVISION WITH A REMAINDER

1. Divide 1264 by 34.

$$
\begin{array}{r}
37 \\
34\overline{)1264} \\
102 \\
\hline
244 \\
238 \\
\hline
6 \quad \text{remainder.}
\end{array}
$$

2. $625 \div 47 = ?$
3. $5538 \div 65 = ?$
4. $2498 \div 27 = ?$
5. $3605 \div 73 = ?$
6. $3929 \div 58 = ?$
7. $3945 \div 67 = ?$
8. $1773 \div 39 = ?$

## TYPE XII

### COST OF MANY GIVEN TO FIND COST OF MANY

$864 was paid for 24 suits. Find the cost of 19 suits at the same price.

$36—cost of 1
24)$864—cost of 24
72
144
144

$36—cost of 1
×19
324
36
$684—cost of 19

1. If 13 hats cost $78, find the value of 20 hats.

2. I paid $120 for 5 watches. What will 13 such watches cost?

3. There are 728 eggs in 14 baskets. How many eggs are there in 8 baskets?

4. Some travelers went 1245 mi. in 15 days. How far would they go in 23 days at the same rate?

5. If 14 lawn mowers cost $154, what will 16 cost?

6. If 17 tables cost $102, what must be paid for 11 tables?

7. If 8 watches cost $128, what will 1 doz. watches cost?

8. There are 133 logs in 7 piles. How many logs are there in 38 piles?

9. Mrs. Jones paid in 64 months $5440 rent. How much was it per year?

## TYPE XIII

### SHORT PROCESS OF MULTIPLYING BY 10 AND 100

1. $487 \times 10 = ?$

$$\begin{array}{r} 487 \\ 10 \\ \hline 4870 \end{array}$$

The answer contains the same figures as the multiplicand with a 0 added at the end.

2. $396 \times 100 = ?$

$$\begin{array}{r} 396 \\ 100 \\ \hline 39{,}600 \end{array}$$

The answer contains the same figures as the multiplicand with 00 added at the end.

(*A*) *To multiply a number by 10, add 0 to the multiplicand to give the product.*

(*B*) *To multiply a number by 100, add two 0's to the multiplicand to give the product.*

3. Multiply 297 by 10.

4. The multiplicand is 346, the multiplier is 10. What is the product?

5. How much is 10 times 946?

6. $3726 \times 10 = ?$

7. $932 \times 100 = ?$

8. At $100 each what will 34 victrolas cost?

9. 100 times $210 = ?$

10. Write the product of 148 multiplied by 100.

## TYPE XIV

### TO FIND A FRACTIONAL PART OF A NUMBER; MORE THAN ONE PART TO BE FOUND

1. Find $\frac{2}{3}$ of 48.

$\frac{1}{3}$ of $48 = 16$.
$\frac{2}{3} = 2$ times $\frac{1}{3}$.
2 times $16 = 32$.
$\therefore$ $\frac{2}{3}$ of $48 = 32$.

2. Find $\frac{3}{4}$ of 32.

$\frac{1}{4}$ of $32 = 8$.
$\frac{3}{4} = 3$ times $\frac{1}{4}$.
3 times $8 = 24$.
$\therefore$ $\frac{3}{4}$ of $32 = 24$.

3. Find $\frac{2}{3}$ of 27.
4. Find $\frac{3}{4}$ of 20.
5. What is $\frac{2}{3}$ of 42?
6. What is $\frac{2}{3}$ of 108?
7. Find $\frac{3}{4}$ of 64.
8. Find $\frac{3}{4}$ of 96.
9. What is $\frac{2}{5}$ of 40?
10. What is $\frac{5}{6}$ of 24?

## TYPE XV

### FINDING HOW MANY MAY BE BOUGHT WITH A CERTAIN SUM WHEN THE COST OF MORE THAN ONE IS GIVEN

If 6 watches cost \$114, how many can I buy for \$589?

6)\$114—cost of 6
\$19—cost of 1

31 times ∴ 31 watches.

\$19)\$589
57
19
19

1. I paid \$840 for 24 months' rent. At that rate for how many months would \$1260 pay?

2. A machine will spin and wind 510 mi. of thread in 17 da. How many days will it take the machine to spin and weave 630 mi.?

3. A wholesaler receives an order for 28 boxes of soap, for which he charges \$84. Later he receives another order for another quantity amounting to \$225. How many boxes were in the second order?

4. If \$476 is paid for 34 coats, how many can be bought for \$238?

5. The wholesale cost of 12 bicycles is \$300. A manufacturer sold his year's output for \$13,000. At the same rate how many bicycles did he make?

6. If 6 yd. of silk cost \$12, how many yards may be bought for \$24?

7. A dealer paid \$1020 for 68 rugs. How many rugs at the same price could he buy for \$450?

8. 5 pairs of shoes cost \$20. How many pairs may be bought for \$48?

## TYPE XVI

### DIVISION OF DOLLARS AND CENTS

1. If 5 pairs of shoes cost \$17.50, find the cost of 1 pair.

5)\$17.50
\$ 3.50

Divide the numbers as in ordinary division and place a point in the quotient *under* the point in the dividend, thus separating dollars and cents.

2. If 24 suits of clothes cost \$441.60, how much will one suit cost?

18.40
24)\$441.60
24
201
192
96
96

Divide the numbers as in ordinary division and place a point in the quotient directly, *over* the point in the dividend to separate the dollars from the cents.

3. If 13 bbl. of flour cost \$81.25, what is the price of one barrel?

4. Paid \$8.85 for 59 railroad tickets. What was the price of each ticket?

5. My bill for 6 chairs was \$45.00. What would it cost me for 3 more at the same price?

6. The divisor is 57; the dividend is \$280.44. What is the quotient?

# REVIEWS FROM FOURTH YEAR—FIRST HALF

## REVIEW A

1. $21\overline{)2814}$ 2. $32\overline{)9984}$ 3. $24\overline{)5832}$

4. $6583+39{,}469+974+28{,}647+7895=?$

5. Multiply 147 by 325.

6. How many dozen are there in 7884?

7. Change 7932 ft. to yards.

8. At \$23 each, how many rugs can a dealer buy for \$552?

9. An owner received in one month \$1512 rent from some flats which rented for \$42 each. How many flats had he?

10. A merchant bought 12 suits at \$3.69 each. How much less than \$50 did they cost?

11. $25\overline{)9125}$ 12. $33\overline{)9174}$

13. Subtract two thousand seven hundred ninety-three from eight thousand one hundred two.

14. A train ran 984 miles at an average rate of 41 mi. per hour. How long did it take?

15. A freight train has 48 loaded cars, each carrying 19 tons. What is the total weight carried?

16. If a regiment of 1152 soldiers is paraded in lines of 24 men each, how many lines are there?

## REVIEW A—*Continued*

17. I bought 16 sectional book cases at $3.75 each. After paying the bill, how much of $100 have I left?

18. If it costs a family on an average $89.57 a month for household expenses, how much is the cost for a year?

19. There are 1773 lb. of rice in 9 bags. What is the weight of each bag of rice?

20. A family used 9836 gal. of water during a period of 6 mo. How many quarts did it use?

21. $34\overline{)7378}$ 22. $43\overline{)9245}$

23. What is the value of 195 acres of land at $67 an acre?

24. Add twenty-three thousand four hundred eight; nine thousand forty-nine; twenty-nine thousand six hundred; eight thousand six hundred seventy-five; twenty thousand eight hundred ninety.

25. It costs a traveler $44 a week for railroad fares and hotel bills. How long will $1012 last him?

26. $4383 \div 9 = ?$

27. A dealer paid $1958 for watches at $22 each. How many did he buy?

28. A woman bought 6 lb. sugar @ 7¢, a bag of flour for 96¢, 2 lb. coffee @ 34¢, and tea for 38¢. What change should she receive from $5?

## REVIEW A—*Continued*

29. A merchant sold for $923 goods that cost him $850. How much was his gain?

30. A manufacturer made 5184 pencils. How many packages of one dozen pencils each did they make?

31. A broker having $6000, bought 61 bonds at $98 each. How much money had he left?

32. Change 6288 in. to feet.

33. Columbus sailed 4521 mi. in 33 days. How many miles did he average per day?

34. Change 96 bu. to quarts.

## REVIEW B

1. The interest for 60 days was $120. How much was that per day?

2. Divide 3808 by 56.

3. How much money must a manufacturer draw from the bank today to pay his 280 employees if each receives $18 wages?

4. Multiply 47 by 59.

5. Add twenty-three thousand eighty-seven; fifty thousand seven hundred eighty; eighteen thousand six hundred nine; four thousand five.

6. I had $223.35 in the bank. I drew out $34.48 and $97.39. How much remained?

7. Joseph won the 880-yd. race. How many feet did he run?

8. I bought a case of eggs (30 doz.) at 28¢ a dozen. Cost?

9. Find the cost of 45 bags of flour at $1.12 a bag.

10. A certain railroad is 256 mi. long. $\frac{1}{8}$ of it is in New York State. How many miles are in New York?

11. It requires $225 every day to pay 75 men. What are the daily wages of each man?

12. $5481 \div 63 = ?$

13. If you waste 20 min. every day, how many minutes will you waste in 30 days? How many hours?

14. $63 \times 520 = ?$

15. I bought 3 lb. meat @ 18¢, 2 qt. potatoes @ 7¢.

## REVIEW B—*Continued*

and 1 doz. bananas for 15¢. What change should I receive from $2?

16. A motorist has 531 mi. to go in 3 days. If he runs 167 mi. on the first day, and 179 mi. on the second day, how many miles are left for the last day?

17. What is the value of 60 doz. blank books at 5¢ a piece?

18. A school day is 5 hr. long. How many minutes long is it?

19. At an election 6552 men were registered, but $\frac{1}{7}$ of them failed to vote. How many did not vote?

20. Change 2464 bu. to pecks.

21. If a man receives a salary of $2160 a year, how much does he get a month?

22. Divide 2989 by 61.

23. $4975+3796+5857+17{,}469+2688=?$

24. 72 miles is one trip for an engineer. How many trips has he made when he has run 4968 mi.?

25. $2544 \div 53 = ?$

26. $1653 \div 29 = ?$

27. Multiply 97 by 24.

28. The receipts at a soda fountain for 64 days were $3776. What were the average daily receipts?

29. $2294 \div 37 = ?$

30. $3285 \div 45 = ?$

31. What will 3 doz. pencils cost at 3¢ each?

## REVIEW B—*Continued*

32. The total receipts from the sale of 35 lots was $9765. How much money was realized per lot?

33. Dividend 9979; divisor 17; find the quotient.

34. 20 gal. of cream will fill how many pint bottles?

35. In a nursery there are 2408 trees, and there are 43 rows of trees. How many trees are there in each row?

36. In a year a family used 384 qt. of potatoes. If it had bought the potatoes by the bushel, how many bushels would it have bought?

37. If a boy could save $50 a year, how long would it take him to save $1000?

| 38. | 39. | 40. |
|---|---|---|
| 65,976 | 48,937 | 33,975 |
| 4,897 | 9,546 | 8,549 |
| 13,758 | 27,659 | 17,636 |
| 685 | 998 | 4,794 |
| 9,209 | 3,865 | 16,553 |
| 2,097 | 784 | 9,487 |

41. If your father pays $20 a month rent, in how many months will he pay the landlord $1500?

42. How many hours are there in a week?

43. I noticed that I took 74 steps in going from my house to the railroad station. Each step measured 28 in. How far is it to the station?

## REVIEW B—*Continued*

44. There are 148 vessels in the navy. Of this number $\frac{1}{4}$ are battleships. How many battleships are there?

45. The government bought 53 typewriters at $36 each. How much did it pay for them?

46. 2044 persons are going on an excursion. Allowing 73 persons to a car, how many cars must the railroad company provide?

47. There are 62 members in a club. Each member pays $24 dues per year. How much do they all pay?

48. $5184 \div 54 = ?$

49. $9684 \div 18 = ?$

50. At a uniform rate of 52 mi. per hour, how long would it take a train to run from New York to Chicago, a distance of 988 mi.?

## REVIEW C

1. Find the cost of 16 kegs of nails, each weighing 100 lb., at 5¢ a pound.

2. $8277 \div 89 = ?$

3. $8360 \div 95 = ?$

4. How many strips of cable, each 88 ft. long, are needed to build one mile (5280 ft.) of line?

5. If 7 cars will hold 8505 bu. of wheat, how many bushels can be put into 30 cars?

6. $6593 + 1769 - 3987 = ?$

7. A man proposes to purchase 20 lots that are for sale at $475 each. What will they cost him?

8. A lady went shopping with $10 in her pocket. She bought some ribbon for $1.50 and gloves for $1.75. Her fare amounted to 20¢, and her lunch cost 35¢. How much of her money had she left?

9. What number must be added to 17,842 to make 21,635?

10. A farmer realized $1472 from his hay crop. At $23 a load, how many loads did he sell?

11. $8160 \div 85 = ?$

12. $7826 \div 86 = ?$

13. What is the cost of 4 doz. hats @ $3 apiece?

14. If 3 houses of equal value can be bought for $8625, what can I get 2 of them for?

15. $4582 - 1785 + 2647 = ?$

16. Multiply 487 by 124.

## REVIEW C—*Continued*

17. At \$78 an acre, how many acres of land can be purchased for \$5000, and how much money will remain?

18. Add seven thousand nine hundred eight; ten thousand forty-seven; four thousand nine; one thousand eight hundred seventy; twenty-one thousand one hundred.

19. Karl's mother gave him \$3. He spent 50¢ for a book, 30¢ for paper, 15¢ for candy, and lost 25¢. How much had he left?

20. If 67 acres of land sell for \$4891, how much ought 50 acres to sell for?

21. $7938 \div 98 = ?$

22. $7896 \div 94 = ?$

23. Find the value of 60 crates of oranges, each containing 15 doz., @ 20¢ a dozen.

24. When riding on the railroad, I counted 33 telegraph posts in passing a mile (5280 ft.). How far apart were the posts?

| 25. | 26. | 27. |
|---|---|---|
| 25,987 | 19,286 | 18,542 |
| 4,653 | 7,939 | 9,678 |
| 19,879 | 24,567 | 3,954 |
| 2,795 | 32,085 | 6,856 |
| 899 | 9,476 | 5,797 |

28. I wished to buy 43 horses which were to cost me \$3741, but I found that I had only enough money for 39 horses. How much money did I have?

## REVIEW C—*Continued*

29. Subtract three thousand five hundred eighty-six from nine thousand ninety-two.

30. Dividend 9801; Divisor 69. Quotient? Remainder?

31. 1500 men were formed into companies of 71 each. How many companies were formed, and how many men were left over?

32. What is the value of a ten-gallon can of milk, at 6¢ a quart?

33. Multiply 25 by 11 (short process).

34. We counted 1776 freight cars that passed our house yesterday. If each train was made up of 48 cars, how many trains were there?

35. If 57 acres produce 4275 bushels of grain, how many bushels can be obtained from 80 acres?

36. Subtrahend 2671. Remainder 1985. Minuend?

37. What is the value of 3 cases of eggs, each containing 30 doz., at 28¢ a dozen?

38. In 3 days a ship sailed 1464 mi. At that rate how far will it go in 7 days?

39. What can I get for a bushel of berries, if I put them in boxes holding 1 pt. each, and sell them for 12¢ a box?

40. If a manufacturer turns out 49 machines a day, in how short a time can he turn out 2989 machines?

41. Find $\frac{1}{8}$ of $7200.

42. Gunners on the battle front were firing 92 shells

## REVIEW C—*Continued*

every hour. At that rate how long would 4968 shells last them?

43. How many inches are there in 24 ft.? (short process.)

44. Write in words the number LXXIII.

45. What will 1500 eggs cost at 27¢ a dozen?

46. In a school with a register of 2706 last June, $\frac{1}{11}$ failed of promotion. How many were not promoted?

47. What is the product of 187 and 376?

48. In 31 days how many hours are there?

49. The sum of two numbers is 9121. One of the numbers is 4983. What is the other?

50. $9870 \div 59 = ?$

## REVIEW D

1. A merchant bought goods for $127, and sold them for $2.65 more than that. How much did he receive?

2. Find $\frac{1}{4}$ of 602.

3. A man bought 6 acres of land for $570. At the same price how much would a farm of 85 acres cost?

4. I bought 8 tons of coal, for which I paid $37.20. What was the cost per ton?

5. A boy earned $7.60 and spent $\frac{3}{8}$ of it for shoes. How much money had he left?

6. How much will 5 ft. of gold wire cost at 2¢ an inch?

7. A wholesaler bought 230 bbl. of flour @ $3.85 a barrel. How much did the flour cost?

8. How long will 9 bu. of potatoes last a family, if it uses a peck a week?

9. Add 6947; 15,876: 21,698; 8465; 11,959; 2945.

10. Find $\frac{5}{8}$ of 5288.

11. I bought the following goods: saw, $3.75; hammer, 78¢; nails, $.20; screw driver, $.32; and twine, $.15. What change did I receive from $10?

12. Divide 6675 by 89.

13. $9165 \div 47 = ?$

14. A man who had $7500 to invest, bought bonds at $93 each. How many bonds did he buy, and how much money had he left?

15. $763 \times 94 = ?$

16. $594 \times 87 = ?$

## REVIEW D—*Continued*

17. What will 98 dresses cost at $4.38 each?

18. I bought 2 doz. blank books at 5¢ apiece and 3 doz. pencils at 2¢ each. What was the cost of all?

19. A boy bought 30 doz. eggs at 22¢ a dozen. He sold 6 doz. @ 27¢, and 24 doz. @ 29¢. How much did he gain?

20. Subtract three thousand four hundred sixty-eight from four thousand one hundred three.

21. Add $650.73; $94.89; $10; $1.24; $.05; $28.04.

22. A man bought 4 gal. of oil which he put into pint bottles and sold at 45¢ a bottle. For how much did he sell it all?

23. A farmer sold 9 bbl. of apples for $14.85. At the same price, what would he receive for 86 bbl.?

24. $9828 \div 78 = ?$

25. $9282 \div 39 = ?$

26. $846 \times 79 = ?$

27. At $3.50 apiece, how much will 3 doz. hats cost?

28. At 8¢ a pint, what will I get for 32 qt. of chestnuts?

29. $\frac{3}{4}$ of 5916 = ?

30. What is $\frac{2}{3}$ of 8235?

31. A grocer has 4 bbl. of apples, each holding 3 bu. He sells the apples at 30¢ a peck. How much does he get for them?

32. How many rods in 3 mi.?

33. A grocer had this morning 14 pk. of potatoes. He has sold 24 qt. today. How many quarts has he left?

## REVIEW D—*Continued*

34. A farmer exchanged 14 doz. eggs, worth 24¢ a dozen, for 56 lb. of sugar. What was the sugar worth a pound?

35. Add 17 thousand nine hundred eight; two thousand fifty-nine; 20 thousand seven; one hundred seventy; 3 thousand two hundred sixty-one.

36. $5226 \div 67 = ?$

37. An egg merchant has received today 480 doz., 180 doz., and 390 doz. He has sold $\frac{4}{5}$ of them. How many dozen has he left?

38. How many feet are there in one-quarter of a mile?

39. Write 94 in Roman numerals.

40. A woman spent $19.25 for a cloak and a pair of shoes. She spent $\frac{5}{7}$ of it for the cloak. Find the cost of each.

41. What is $\frac{5}{8}$ of 1431?

42. If 7 lb. of sugar cost 28¢, how much will 25 lb. cost?

43. 24 people have bought a quart of potatoes each; 20 have bought 2 qt. each; and 12 people have bought a peck each. How many bushels have been sold?

44. A huckster bought 10 bu. of onions for $10. He sold them at 10¢ a quart. How much did he gain?

45. If 28 bbl. of flour cost $130.20, how much will 45 bbl. cost?

46. 32 bu. of potatoes cost me $20.80. If I should sell a bushel for $1, how much would I gain?

## REVIEW D—*Continued*

47. A capitalist sold 78 shares of stock for $112 each, and with the money bought other shares at $96 each. How many shares did he buy?

48. A man sold 46 sheep for $211.60. How much apiece did he sell them for?

49. What will 324 books cost at $1.27 each?

50. $1100 \div 82 = ?$

## REVIEW E

1. Find the difference between \$78.29 and \$432.

2. $4292 \div 58 = ?$

3. $6586 \div 74 = ?$

4. Nine bushels of potatoes cost me \$8.55. At the same rate, what will 20 bu. cost?

5. $2653 + 4795 + 12{,}567 + 984 + 3879 = ?$

6. A farmer sold 18 bbl. of apples @ \$1.85 a barrel; 25 bbl. @ \$1.75; and 39 bbl. @ \$1.60. What did he receive for all of them?

7. A man sold $\frac{2}{3}$ of a flock of 375 sheep @ \$4 apiece. How much did he receive for them?

8. A merchant had 56 bu. He has sold 18 bu. What is the remainder worth at 65¢ a bushel?

9. Find the cost of $\frac{1}{2}$ mi. of wire @ 2¢ a foot.

10. What must be added to \$87.36 to make the amount \$200?

11. Multiply 876 by 58.

12. A grocer bought flour @ \$6 a barrel, paying \$396 for it. How many barrels did he buy?

13. Divide 7424 by 29.

14. Add 23 thousand nine hundred; 7 thousand seven hundred eighty; eight hundred six; ten thousand forty-nine.

15. Find the difference between 6183 and 5994.

16. At 2¢ a mile, how much will a railroad ticket for a distance of 443 mi. cost?

## REVIEW E—*Continued*

17. A man drew \$9450 from the bank, and spent $\frac{8}{9}$ of it for a house. How much did the house cost?

18. A grocer sold 14 bu. of potatoes @ \$.35 a peck. How much did he receive?

19. Change 19 mi. to rods.

20. Reduce 497 gal. to quarts.

21. Reduce 385 bu. to pecks.

22. Reduce 7568 oz. to pounds.

23. Reduce 3 mi. to feet.

24. $5382 \div 39 = ?$

25. $7943 \div 47 = ?$

26. At 8¢ a quart, what cost 43 gal. of vinegar?

27. What will 9 oz. of butter cost at 32¢ a pound?

28. A shepherd sold 175 sheep, lost 35 sheep, and had 467 sheep left. How many sheep had he at first?

29. Add \$134.75, \$78.16, \$5.05, \$340, \$197.05, \$.87.

30. What will a shoe dealer receive for 132 pairs of shoes at \$3.75 a pair?

31. Two yards of ribbon were equally divided into 8 badges. How many inches were there in each?

32. Subtract the sum of 897 and 789 from the sum of 958 and 947.

33. Add $\frac{5}{8}$ of 752 to $\frac{2}{3}$ of 1110.

34. $4902 \div 86 = ?$

35. $9796 \div 79 = ?$

36. Charles had 126 marbles. He divided $\frac{5}{7}$ of them

## REVIEW E—*Continued*

equally among 6 companions. How many did each receive?

37. A boy bought 2 doz. magazines at 3¢ each and sold them at 5¢ each. How much did he gain?

38. A man having $9250, invested it in land at $95 an acre. How many acres did he buy, and how much money had he left?

39. Change 8622 ft. to yards.

40. A grocer sells a ten-gallon can of milk each day. If the milk costs him $1.25, and he sells it @ 5¢ a quart, how much money does he make?

41. The product of two numbers is 4002. If the multiplier is 69, what is the multiplicand?

42. $6958+2179-5783=?$

43. What will be received for a barrel of sugar, weighing 444 lb., put up in 6-lb. packages, and sold at 32¢ a package?

44. A storekeeper bought 144 candies for 25¢. He sells them 3 for a cent. How much will he make?

45. Multiply (short process) 53 by 11, and 74 by 12. Add the products.

46. A manufacturer makes 1008 lead pencils an hour, which he wraps one dozen to a package. How many packages does he make in an 8-hour day?

47. He makes 1700 envelopes every minute. How many packages of 25 are made in an hour?

48. What number divided by 48 gives a quotient of 137?

## REVIEW E—*Continued*

49. Add XCIV, LXXVI, XLIX, LXI, LXXXIX.

50. A lady made these purchases: fruit, \$.35; crackers, \$.20; cereal, \$.14; lemons, \$.20; tea, \$.59; butter, \$.43. What change did she receive from \$5?

51. Each elevated car seats 48 persons. How much money does the company receive from a train load of 7 cars with all the seats filled?

52. How much greater is $\frac{5}{8}$ of 726 than $\frac{4}{7}$ of 1057?

# INDEX

*NUMBERS REFER TO LESSONS*


### Addition

2 13 29 38
3 14 30 43
4 22 31 46
6 23 32 48
7 24 34 52
8 25 35 54
10 26 37 56

### Subtraction

4 14 30 46
5 15 34 49
7 16 35 51
10 18 37 53
13 20

### Multiplication

2 13 26 47
3 14 30 50
4 17 31 51
6 19 32 52
7 21 34 56
8 22 40 58
9 24 41 59
12

### Division

1 9 19 32
2 12 20 37
3 14 21 38
4 15 22 53
6 16 23 54
7 17 27 57
8 18 31 58

### Fractional Parts

5 15 27 39
6 16 30 44
7 20 31 45
8 22 32 51
13 24 33 52
14 25 35 53

### Addition of Fractions

5 18 31 45
6 19 32 50
7 20 33 51
8 21 34 53
9 22 35 54
11 23 36 55
12 24 37 56
13 25 39 57
14 26 40 58
15 27 41 59
16 28 42 60
17 30 43

### Subtraction of Fractions

5 18 30 42
6 19 31 43
7 20 32 44
8 21 33 45
10 22 34 49
11 23 35 50
12 24 36 54
13 25 37 56
14 26 38 58
15 27 39 59
16 28 40 60
17 29 41

### Roman Numerals

2 19 37 44
3 28 38 45
10 29 39 46
17 33 41 57

### Cancellation

39 43 47 53
40 44 48 54
41 45 49 59
42 46 50

### Area

43 47 51 55
44 48 52 56
45 49 53 60
46 50

### Reduction of Fractions

11 14 29 37
12 16 30 50
13 18

### To Lower Terms

9 10 26

### Mixed Numbers

29 30 34 36 37

### Common Multiple

17 18

### Notation

1 13 29 51
2 20 31 52
3 22 32 53
6 23 35 54
10 24 38

### Numeration

1 10 38
3 29 50

### Multiplication of Fractions

49 52 55 57
50 53 56 60
51 54

TWO OPERATIONS

4 24 41 48
8 28 42 51
17 31 44 52
19 33 45 53
22 34 46 54
23 35 47

BILL

21 29 34

LONG MEASURE

1 17 26 41
2 18 29 59
13 24 34 60

SQUARE MEASURE

44 47 51 55
45 48 54 56
46 49

DRY MEASURE

21 55 59
23 56 60
27 57

LIQUID MEASURE

17 32 58
20 55 59
25 56 60
28 57

AVOIRDUPOIS WEIGHT

20 25 38

TIME MEASURE

22 24 34

DOZEN

17 34 49
19 40 51
28


## INDEX OF TYPES


| TYPES | | PAGE |
|---|---|---|
| I. | Long Division by Three Figures | 10 |
| II. | Multiplication with 0 in Tens' Place | 13 |
| III. | Addition of Fractions with Same Denominator | 20 |
| | Subtraction of Fractions with Same Denominator | 21 |
| | Subtraction of Mixed Numbers | 21 |
| IV. | Addition of Fractions, where the Sum of the Fractions Equals a Unit | 24 |
| V. | Reduction of Fractions to Lower Terms | 30 |
| VI. | Reduction of Fractions to Higher Terms | 33 |
| VII. | Reduction of Improper Fractions to Whole or Mixed Numbers | 44 |
| VIII. | Addition of Fractions and Mixed Numbers | 44 |

| TYPES | | PAGE |
|---|---|---|
| IX. | Common Multiple | 56 |
| X. | Addition and Subtraction of Fractions with Different Denominators | 53 |
| XI. | Addition and Subtraction of Fractions Having Different Denominators with Numerators More than One | 60 |
| XII. | Subtraction of a Mixed Number from a Whole Number | 75 |
| XIII. | Reduction of a Mixed Number to an Improper Fraction | 82 |
| XIV. | Subtraction of Mixed Numbers, the Subtrahend Fraction Larger | 85 |
| XV. | The Use of the Horizontal Line in Division | 107 |
| XVI. | Cancellation | 114 |
| XVII. | Areas | 117 |
| XVIII. | Multiplication of an Integer by a Fraction Consisting of a Unit and a Fraction Whose Numerator is a Unit | 135 |

REVIEW TYPES

| | | |
|---|---|---|
| I. | Long Division | 165 |
| II. | Division with 0 in Quotient | 167 |
| III. | Multiplication by Cypher | 168 |
| IV. | Division | 169 |
| V. | Multiplication of Dollars and Cents | 170 |
| VI. | Division by 19, 29, 39, etc | 171 |
| VII. | Division with Cyphers | 172 |
| VIII. | Terms in Division | 173 |
| IX. | Multiplication of Cents | 174 |
| X. | Short Process of Multiplication by 11 and 12 | 175 |
| XI. | Division with a Remainder | 176 |
| XII. | Cost of Many to Find Cost of Many | 177 |
| XIII. | Short Process of Multiplying by 10 and 100 | 178 |
| XIV. | To Find Fractional Part of a Number | 179 |
| XV. | To Find How Many May Be Bought when Cost of Many is Given | 180 |
| XVI. | Division of Dollars and Cents | 181 |

REVIEWS OF FOURTH YEAR—FIRST HALF

A, B, C, D, and E ..... 182–200

# ANSWERS

### TYPE I

3. 326
4. 324
5. 456
6. 227
7. 813
8. 195
9. 478
10. 509
11. 608

### LESSON 1

1. 15
2. 240
3. 36¢
4. $4.71
5. 156
8. 116,385
9. 201,600
10. 18 mi.

### LESSON 2

1. 143
2. 536
3. 225
4. 31
5. $675
6. 893,662
8. CIX, CL, CXLIX, CLXXXIV, CLXIII
9. 456,325
10. $8704.53

### TYPE II

2. 157,685
3. 596,548
4. 480,128
5. 24,045
6. 71,862
7. 116,544
8. 1,526,850
9. 409,116
10. 101,504

### LESSON 3

1. $151,776
2. 301,158
3. $827.64
4. 92,226
5. 41,820
6. 974,372
7. $120.32
9. CC, CCLIX, CCXXXIX, CCXIX, CCLXXIV
10. 889

### LESSON 4

1. $384.56
2. $1306.62
3. 452,244
4. $1747.83
5. $21.60
6. $6.31
7. 149,485
8. $27.30
9. $38.70
10. $76

### Review I

1. $2.28
2. 324
3. 317
4. 85,374
6. 603
7. 64,278
8. 120
9. 97,920
10. 989

TYPE III

2. $\frac{6}{8}$
3. $\frac{2}{4}$
4. $\frac{10}{11}$
5. $\frac{14}{17}$

1. $9\frac{6}{7}$
2. $15\frac{15}{19}$
3. $22\frac{8}{11}$
4. $258\frac{22}{27}$
5. $24\frac{12}{15}$

2. $\frac{5}{9}$
3. $\frac{3}{7}$
4. $\frac{4}{13}$
5. $\frac{6}{15}$

2. $5\frac{3}{7}$
3. $1\frac{2}{9}$
4. $3\frac{2}{4}$
5. $5\frac{2}{12}$
6. $25\frac{4}{18}$

LESSON 5

1. $56\frac{6}{7}$
2. $\frac{7}{25}$, $\frac{4}{16}$
3. $5\frac{1}{3}$
4. $133.75
5. $113\frac{7}{8}$
7. 432
8. 266
9. $2004
10. 369

LESSON 6

1. $95\frac{5}{8}$
2. $11\frac{8}{24}$
3. $23\frac{9}{16}$
4. $108\frac{5}{10}$
5. $12\frac{4}{20}$
6. 989,073
7. 567
8. $641
9. 899,045
10. 180,432

TYPE IV

2. 8
3. 15
4. 11
5. $21
6. 15
7. 23
8. 25
9. 18
10. 16

LESSON 7

1. $50
2. 48
3. 51
4. $400
5. 926,551
6. 476
7. $1533.84
8. 1060
9. 9200
10. $3\frac{2}{11}$

LESSON 8

1. 49
2. 34
3. $48
4. 205
5. 894,347
6. $5200
7. 435,456
8. $11,750
9. $29\frac{5}{10}$
10. $4195.20

Review II

1. 54
2. $58\frac{1}{10}$
3. 266
4. 119,168
5. 160
6. 456
7. 45
8. 12
9. 117
10. 797,239

LESSON 9

1. $\frac{3}{8}$
2. $\frac{3}{4}$
3. $\frac{2}{3}$
4. $\frac{3}{4}$
5. $\frac{3}{4}$
6. $978.50
7. 3030 (+111)
8. $3.75
9. $32\frac{11}{12}$
10. 13

### Lesson 10

1. $\frac{8}{9}$
2. $\frac{3}{10}$
3. $\frac{3}{8}$
4. $16\frac{2}{3}$
5. $\frac{2}{7}$
7. 686,233
8. CCCXCVIII, CCCLVI, CCCXXIII, XLVI, XIX, CXLVII
9. 78,174
10. 921,539

### Lesson 11

1. $\frac{32}{40}$
2. $\frac{9}{24}$
3. $\frac{40}{48}$
4. $\frac{14}{18}$
5. $\frac{10}{34}$
6. $20\frac{7}{10}$
7. $164\frac{3}{5}$
8. $201\frac{25}{31}$
9. $177\frac{15}{16}$
10. $7\frac{5}{6}$

### Lesson 12

1. $\frac{16}{36}$
2. $\frac{55}{60}$
3. $\frac{24}{30}$
4. $\frac{32}{44}$
5. $81\frac{2}{43}$
6. $\frac{17}{21}$
7. $\frac{31}{36}$
8. $6882.75
9. $2805.46
10. $14.75

### Review III

1. $\frac{9}{16}$
2. $\frac{27}{72}$, $\frac{48}{72}$, $\frac{60}{72}$, $\frac{66}{72}$
3. 465
4. $165\frac{9}{32}$
5. 235,638
6. 29
7. $1.44
8. 879,317
9. CCCXCIV, CCCXLIX, CCLXV
10. 3274

### Review A

1. 432
2. 342
3. 133,744
4. 240,570
5. $\frac{2}{3}$, $\frac{3}{8}$, $\frac{5}{12}$
6. $\frac{8}{48}$, $\frac{32}{48}$, $\frac{20}{48}$, $\frac{18}{48}$
7. $15\frac{1}{6}$
8. $270\frac{13}{25}$
9. $179.16
10. $37.98
11. $7.50
12. 216
13. 231,949
14. 376
15. 576
16. 245
17. 291,232
18. 397,773
19. $127\frac{16}{35}$, $47\frac{7}{35}$
20. $\frac{4}{7}$, $\frac{11}{30}$ $\frac{9}{25}$, $\frac{5}{18}$, $\frac{1}{2}$, $\frac{7}{11}$
21. $\frac{64}{72}$, $\frac{42}{72}$, $\frac{60}{72}$, $\frac{54}{72}$, $\frac{24}{72}$, $\frac{45}{72}$, $\frac{28}{72}$, $\frac{15}{72}$
22. 1785
23. $9765
24. 27
25. 169
26. 948
27. $12,500, $10,000
28. $25.60
29. $94.25
30. 12 (+49)
31. $1.44
32. 423
33. 354
34. 496,275
35. 593,028
36. $939.60
37. $8.25
38. 4856
39. gain $619.75
40. 837

### LESSON 13

1. $29\frac{1}{2}$
2. $14\frac{1}{4}$
3. \$19.50
4. \$220.50
5. 61
6. 183
7. $\frac{2}{3}$, $\frac{7}{12}$, $\frac{3}{10}$
8. \$128
9. 75
10. 823,201

### LESSON 14

1. $37\frac{1}{6}$
2. $19\frac{5}{11}$
3. $312\frac{6}{10}$
4. 54
5. 168
6. 196
7. \$77
8. \$27.20
9. $\frac{12}{18}$, $\frac{16}{24}$, $\frac{18}{24}$, $\frac{24}{32}$
10. 943,511

### TYPE VII

4. $4\frac{1}{2}$
5. $1\frac{2}{3}$, $1\frac{2}{5}$, $4\frac{1}{2}$, $5\frac{1}{4}$, $15\frac{2}{3}$, $6\frac{1}{8}$
6. 4, $10\frac{1}{11}$, 12

### TYPE VIII

2. $1\frac{4}{11}$
3. $12\frac{2}{9}$
4. \$$7\frac{3}{4}$

### LESSON 15

1. $49\frac{1}{2}$
2. $1\frac{1}{3}$
3. $6\frac{7}{8}$
4. $331\frac{5}{11}$
5. $152\frac{1}{4}$
6. $351\frac{1}{5}$
7. \$443
8. 406
9. 1200
10. \$39

### LESSON 16

1. $29\frac{5}{14}$
2. $19\frac{2}{7}$
3. $58\frac{4}{11}$
4. $77\frac{1}{3}$
5. loss $32\frac{1}{2}$ lb.
6. 600 and 400
7. 496
8. $1\frac{2}{9}$
9. $\frac{24}{27}$, $\frac{32}{56}$, $\frac{40}{88}$
10. 408

### Review IV

1. 568
2. $82\frac{4}{5}$
3. 51
4. $226\frac{3}{8}$
5. \$2.40
6. \$4775
7. 395 and 553
8. $\frac{3}{4}$, $\frac{9}{10}$, $\frac{5}{9}$
9. $\frac{36}{60}$, $\frac{16}{60}$, $\frac{9}{60}$, $\frac{35}{60}$
10. 426,636

### LESSON 17

1. (*a*) 12; (*b*) 12 and 24
2. (*a*) 20; (*b*) 24, 48, 72
3. (*a*) 30; (*b*) 30
4. $131\frac{10}{13}$
5. $\frac{1}{2}$
6. CCCIX, CCXLVII, CCCLXXXV
7. \$25.20
8. 800
9. 59
10. \$7.20

### LESSON 18

1. 72
2. 12
3. 72, 60
4. $\frac{18}{24}$, $\frac{15}{24}$, $\frac{12}{24}$
5. $\frac{15}{20}$, $\frac{16}{20}$
6. $\frac{28}{48}$, $\frac{32}{48}$, $\frac{15}{48}$
7. 3
8. $4\frac{1}{4}$
9. 6
10. 887

### TYPE X

3. $13\frac{9}{20}$
4. $21\frac{5}{12}$
5. $\frac{5}{8}$

6. $21\frac{11}{20}$
7. $4\frac{1}{4}$
8. $3\frac{1}{24}$

LESSON 19

1. $15\frac{3}{4}$
2. $5\frac{1}{2}$
3. $1\frac{1}{10}$
4. $26\frac{7}{8}$
5. $18\frac{7}{12}$
6. $6\frac{3}{4}$
7. 409, CDLXVIII, 440 D
8. \$43.20
9. $3\frac{1}{12}$
10. $31\frac{1}{24}$

LESSON 20

1. $18\frac{1}{3}$
2. $132\frac{7}{24}$
3. $28\frac{7}{20}$
4. $100\frac{5}{7}$
5. 205
6. $73\frac{1}{2}$
7. 599,706
8. \$4.25
9. 128
10. 8

Review V

1. 60
2. CDIX, CCCIV, CDXCIV, CCXLIX, CDLXVI
3. $4\frac{7}{8}$
4. $1\frac{1}{48}$
5. 64
6. \$16
7. $84\frac{9}{14}$
8. $15\frac{4}{45}$
9. \$228.63
10. 545

TYPE XI

2. $8\frac{7}{12}$
3. $22\frac{18}{30}$
4. $7\frac{8}{21}$
5. $5\frac{1}{2}$
6. $92\frac{1}{15}$
7. $17\frac{9}{40}$
8. $7\frac{1}{4}$

LESSON 21

1. $22\frac{5}{12}$
2. $49\frac{1}{12}$
3. $69\frac{19}{48}$
4. $31\frac{1}{3}$
5. $35\frac{35}{36}$
6. $\$13\frac{1}{8}$
7. \$13.05
8. 349
9. \$6.20
10. \$8

LESSON 22

1. $21\frac{1}{27}$
2. $87\frac{2}{11}$
3. $9\frac{4}{15}$
4. $3\frac{7}{24}$
5. $12\frac{1}{2}$
6. 1440
7. \$234
8. 614,695
9. 78
10. 1500

LESSON 23

1. $5\frac{5}{18}$
2. $3\frac{1}{8}$
3. $2\frac{1}{6}$
4. $52\frac{1}{4}$
5. $26\frac{1}{3}$
6. $44\frac{19}{24}$
7. 690,811
8. \$81.84
9. 5
10. 275

LESSON 24

1. $147\frac{5}{16}$
2. $12\frac{1}{6}$
3. \$36.20
4. 36
5. 740,987
6. 90,480
7. 20
8. \$4860

9. 880
10. 976

Review VI

1. \$4707.78
2. $55\frac{7}{16}$
3. \$1.30
4. 58¢
5. \$2.48
6. \$14.48
7. $26\frac{5}{12}$
8. \$106.65
9. \$2.87
10. \$45,474

Review B

1. 8866
2. 70
3. 56
4. 91,717
5. \$108
6. 79,356
7. 1440
8. 256
9. \$105.75
10. \$149.40
11. 86,819
12. \$9750
13. 34,258
14. \$107.19
15. 90,932
16. \$4.24
17. 738
18. $140\frac{1}{4}$
19. \$11.20
20. 12,565
21. 32¢
22. 87,572
23. 90¢
24. 32,273
25. \$49
26. 36
27. 1056
28. 3676
29. 17¢
30. 7901
31. $56\frac{11}{24}$
32. \$402
33. CCCLXXV, CDLXXXIII, CCXXIV
34. $59\frac{7}{12}$
35. \$262.26
36. $14\frac{1}{12}$
37. 28,035
38. 10,305
39. 208
40. 7
41. \$1715
42. $125\frac{15}{16}$
43. \$49
44. $42\frac{1}{2}$
45. \$69
46. $39\frac{3}{8}$
47. 68
48. \$18.61
49. 15¢
50 591

LESSON 25

1. $294\frac{3}{5}$
2. $72\frac{1}{8}$
3. $2\frac{1}{8}$
4. $60\frac{1}{6}$
5. 260
6. 66 yd.
7. \$6
8. 811,594
9. 80
10. 8

TYPE XII

2. $1\frac{1}{4}$
3. $2\frac{5}{7}$
4. $4\frac{2}{3}$
5. $11\frac{1}{6}$
6. $5\frac{2}{13}$
7. \$15.25
8. $115\frac{5}{8}$
9. $32\frac{3}{5}$
10. $49\frac{5}{7}$ mi.

LESSON 26

1. $53\frac{5}{9}$
2. $35\frac{1}{4}$
3. $5\frac{5}{6}$ ft.
4. $3\frac{3}{4}$
5. \$4.75
6. \$60.75
7. 7629
8. 3792
9. $\frac{3}{5}$
10. 26,400

LESSON 27

1. $42\frac{3}{4}$
2. $17\frac{7}{10}$
3. $41\frac{2}{5}$
4. $8\frac{4}{9}$ ft.
5. $4\frac{1}{36}$
6. $136\frac{11}{24}$
7. $66.24
8. $30\frac{4}{7}$
9. 86
10. 56

LESSON 28

1. $111\frac{3}{5}$
2. $44\frac{4}{9}$
3. $15\frac{3}{8}$
4. 21
5. DCIX, DCXXXVIII, DCLXXIII, CDLII
6. $3\frac{3}{5}$
7. $10\frac{5}{18}$
8. 649, 685, 693.
9. $3.24
10. $16

Review VII

1. $15\frac{1}{24}$
2. $4\frac{5}{8}$ in.
3. $1\frac{5}{8}$
4. $14\frac{5}{8}$
5. $22\frac{1}{8}$
6. $19.50
7. 172 (+36)
8. $12
9. $1.80
10. $21.60

TYPE XIII

6. $77\frac{7}{8}$
7. $\frac{22}{21}$
8. $\frac{29}{8}$
9. $\frac{43}{9}$, $\frac{32}{4}$, $\frac{207}{11}$, $\frac{520}{31}$

LESSON 29

1. $\frac{37}{4}$, $\frac{27}{8}$, $\frac{22}{9}$
2. 53
3. 77
4. 31,586
5. $99\frac{4}{5}$
6. CCXXXIX, CDLVI, DXCIX, DCXCIV
8. 710,312
9. $3.13
10. $96

LESSON 30

1. $\frac{56}{9}$
2. $\frac{87}{14}$
3. $\frac{64}{5}$
4. $\frac{60}{7}$
5. $\frac{122}{9}$
6. 75,555
7. 320
8. $82
9. 140
10. $1527

TYPE XIV

2. $1\frac{7}{12}$
3. $3\frac{1}{2}$
4. $2\frac{5}{6}$
5. $5\frac{23}{33}$
6. $1\frac{1}{2}$
7. $10\frac{3}{4}$

LESSON 31

1. $31\frac{1}{2}$
2. $8\frac{3}{4}$
3. $252\frac{11}{16}$
4. $17\frac{3}{4}$
5. $6\frac{1}{8}$
6. $30\frac{13}{20}$
7. $29\frac{1}{8}$
8. 37
9. $957
10. 6,683,510

LESSON 32

1. $\frac{5}{12}$ mi.
2. $3\frac{7}{8}$
3. $96\frac{17}{24}$
4. $109\frac{7}{20}$
5. 168 qt., 336 pt.
6. 1,774,665
7. $78\frac{7}{8}$ yd.
8. 12,412
9. $81\frac{56}{60}$
10. 69

### Review VIII

1. $\frac{135}{8}, \frac{100}{3}, \frac{45}{16}, \frac{41}{7}$
2. $97\frac{37}{40}$
3. $7\frac{7}{15}$
4. 2430, 216, 540, 54
5. 4450, 26,700
6. \$341.83, \$70.62
7. \$2.88
8. $14\frac{5}{8}$
9. \$48.72
10. $215\frac{4}{5}$ mi.

### Lesson 33

1. $6\frac{7}{24}$
2. $74\frac{14}{45}$
3. $2\frac{5}{18}$
4. $7\frac{9}{16}$ ft.
5. $2\frac{5}{8}$ mi.
6. 102
7. \$35
8. $569\frac{20}{33}$
9. DCCVI, DCCXXXVII, DCCLXX, DCXLIV, DXXI
10. \$15

### Lesson 34

1. $153\frac{17}{20}$
2. $8\frac{4}{5}$
3. $5\frac{7}{11}$
4. \$2.50
5. $\frac{275}{4}, \frac{179}{10}$
6. 2¢
7. 18 min.
8. \$9.60
9. \$98
10. \$3648.75

### Lesson 35

1. $108\frac{11}{40}$
2. $13\frac{1}{8}$
3. \$36.05
4. $1\frac{5}{8}$
5. $38\frac{5}{24}$
6. 937,656
7. $76\frac{1}{12}$
8. \$489.25
9. $77\frac{7}{8}$
10. \$41,624

### Lesson 36

1. $43\frac{1}{9}$
2. $\frac{649}{14}$
3. $320\frac{1}{8}$
4. $110\frac{5}{36}$
5. $\frac{2383}{48}$
6. $768\frac{3}{8}$
7. $113\frac{2}{63}$
8. $91\frac{7}{20}$
9. $6\frac{5}{24}$
10. $523\frac{9}{16}$

### Review IX

1. $16\frac{7}{8}$, $19\frac{1}{6}$, $37\frac{3}{4}$, $29\frac{2}{3}$
2. $58\frac{3}{4}$
3. $142\frac{23}{24}$
4. $8\frac{11}{20}$
5. $46\frac{9}{20}$
6. 27
7. \$28, \$35
8. $\frac{49}{2}, \frac{262}{3}, \frac{99}{5}, \frac{125}{4}$
9. 800
10. \$57.60

### Review C

1. 595,108
2. 561,308
3. \$4056.25
4. \$811.25
5. 578
6. $2064\frac{13}{24}$ bu.
7. $113\frac{3}{8}$ ft.
8. $\frac{3}{8}$ in.
9. XLVII CXCIV, CCIX, DXXXVIII
10. 54
11. 254,500
12. \$9556.37
13. 408,884
14. 97 da.
15. $144\frac{3}{4}$ ft.
16. $1\frac{5}{8}$ ft.
17. $68\frac{7}{8}$ mi.
18. 1
19. 7¢
20. \$975
21. 7383

22. $302,400, $189,000, $75,600
23. $1300
24. 2655 lb.
26. $26,489.07
27. $28\frac{5}{8}$ lb.
28. $3.92
29. 85¢
30. 146 (+35 qt.)
31. $2.57
32. 223,494
33. $8\frac{25}{42}$
34. $126\frac{1}{45}$
35. $7\frac{43}{60}$
36. 19 da.
37. 3600, 86,400
38. $5
39. $250
40. 445 ft.
41. $2086
42. 76¢
43. gain $13.72
44. $82\frac{5}{8}$
45. $208\frac{3}{8}$
46. $\frac{1979}{16}$
47. $\frac{36}{44}$
48. $20\frac{31}{40}$
49. $7\frac{7}{8}$
50. 70,755

## Lesson 37

1. $121\frac{1}{3}$
2. 814,974
3. 45,201, 183
4. $152\frac{31}{60}$
5. $\frac{1744}{16}$
6. $6\frac{3}{8}$
7. $351\frac{3}{16}$
8. $184\frac{7}{12}$ yd.
9. $65\frac{11}{12}$ ft.
10. DCCCIX
    DCCCXCI
    DCCCXIX
    DCCCXXVI

## Lesson 38

1. $25\frac{5}{12}$
2. $4\frac{7}{16}$ lb.
3. 198
4. 762,076
5. $9
7. $243\frac{1}{2}$
8. 782,762
9. 830,148
10. CDLI
    DCXXVIII,
    DCCXLIX,
    DCCCXCVIII
    DCCCXLVII

## TYPE XV

5. 50
6. 28
7. 32
8. 18

## Lesson 39

1. 240
2. 72
3. 72
4. $37\frac{1}{3}$
5. 8
6. 168
7. 2170
8. $25\frac{29}{80}$
9. CMXVIII,
   CMXXVIII,
   CMXXXVII,
   CMLV
10. $40\frac{1}{99}$

## Lesson 40

1. 36
2. 64
3. 14
4. 5
5. 48
6. 20
7. 12¢
8. 15
9. $5\frac{13}{40}$
10. $382.08

## Review X

1. $14\frac{11}{16}$
2. $12
3. $\frac{5}{8}$ yd.
4. $5\frac{9}{10}$

5. 119
6. 6
7. \$1.12
8. 20
9. 321
10. $28\frac{5}{8}$

TYPE XVI

2. \$60
3. \$24
4. 75¢
5. 216
6. 440
7. \$15

LESSON 41

1. \$1.35
2. \$108
3. 2880
4. \$218.40
5. CMLXXXIX, CMXVII, CMLVII, CCCXIV, CDLXV
6. 64
7. 4
8. 10,560
9. $139\frac{71}{120}$
10. $97\frac{13}{24}$

LESSON 42

1. \$105
2. 10 da.
3. \$108
4. 12
5. 3
6. 80
7. 24
8. $121\frac{13}{24}$
9. \$212.50
10. \$2424

TYPE XVII

2. 480
3. 270
4. 360
5. 2880 sq. ft.
6. \$135
7. \$28

LESSON 43

1. 120 sq. ft.
2. 192
3. 540 sq. in.
4. 26,125 sq. ft.
5. 625 sq. yd.
6. 6
7. \$20
8. $909\frac{5}{8}$
9. $74\frac{11}{12}$
10. 991,437

LESSON 44

1. 5184
2. 5194 sq. ft.
3. 33
4. 40
5. 2592 sq. in.
6. CCXXXVI, DCCCIV, CDXXVII, CMLXXXIII, CDLXI
7. \$52,500
8. $2935\frac{1}{20}$ bu.
9. 2128
10. 4

Review XI

1. 1 pt.
2. 15¢
3. \$1080
4. 4
5. $18\frac{29}{48}$
6. 40
7. \$396
8. 2859
9. \$1728
10. \$104

LESSON 45

1. 64
2. 110 sq. ft.
3. 40
4. 1152
5. 66
6. 324
7. CCLXXXIX, CCCXXVII, DCXIV, CMLXV, DCCVI

8. 2652, 442, 884
9. 3
10. $12\frac{13}{24}$

LESSON 46

1. 360; 51,840 sq. in.
2. 32
3. 5184
4. 1152
5. 39
6. CCVI, CDIX CCCXXVII, CMXVIII, CDLXV
7. 60
8. $32.25
9. 9
10. 17,280 sq. in.

LESSON 47

1. $30
2. $2.16
3. 117
4. $648
5. $58.32
6. $34.89
7. $112.50
8. $25.60
9. $220.32
10. $112

LESSON 48

1. $15.75
2. $51.84
3. $56.70
4. $29.75
5. $58.32
6. $1016.61
7. $19.54
8. 868,922
9. $10,841.93
10. $28.80

Review XII

1. $18
2. $6\frac{7}{8}$ in.
3. 5
4. $18.40
5. $43\frac{3}{40}$ mi.
6. $6\frac{3}{8}$ mi.
7. $4900
8. $20\frac{5}{6}$ mi.
9. 432
10. $6.30

Review D

1. $14.05
2. $2875.46
3. $36
4. $48
5. 36
6. 1937
7. $5340
8. $8525
9. $7.92
10. 86
11. 15
12. $39.62
13. $1680
14. $256
15. 373
16. $550
17. $507
18. $2375
19. $1440
20. 30 eggs
21. $12
22. 1152
23. 14
24. 90, $337.50
25. 24′ 9″
26. 64 da.
27. 56
28. $14\frac{23}{24}$
29. $39\frac{37}{70}$
30. 25,631
31. 8325
32. 2452
33. $342.75
34. 4¢
35. 20
36. 27¢
37. 4125
38. 18
39. 74
40. $41\frac{4}{13}$

41. DCCCXIV, DCCLIX, DCLXI
42. 560,000
43. 280
44. $67\frac{1}{2}$ mi.
45. \$60
46. 30¢
47. 450
48. 214
49. \$513
50. \$3.47

TYPE XVIII

2. 60
3. 48
4. 36
5. 114
6. 80
7. 108
8. 112
9. 80
10. \$36

LESSON 49

1. \$4.50
2. 162
3. \$19.20
4. $\$3.37\frac{1}{2}$
5. 16,992
6. 403 sq. yd.
7. 21
8. \$45.80
9. \$3
10. $2705\frac{7}{10}$

LESSON 50

1. 1680
2. 312
3. \$3.24, \$4.05
4. 16,960 sq. yd.
5. 1748
6. 234
7. $165\frac{11}{16}$
9. 36
10. $\frac{768}{16}$, $\frac{2213}{12}$

LESSON 51

1. \$64.05
2. 3540 sq. yd.
3. \$2.52
4. 16,480 sq. ft.
5. 232,320
6. \$9.60
7. 245,089
8. \$600, \$250, \$1150
9. 200
10. \$540

LESSON 52

1. \$522.50
2. 36,000
3. \$420
4. 1200 sq. ft.
5. 184,832
6. 162
7. 176,587
8. \$17.70
9. 250
10. 20

Review XIII

1. \$138
2. 1152
3. \$54.40
4. \$1.80
5. $43\frac{3}{8}$
6. 187
7. \$5
8. \$232.80
9. 90
10. 36

LESSON 53

1. 90
2. 70
3. 70
4. \$900
5. 98
6. 360
7. 58,449
8. 504 bu.
9. 540
10. 20

LESSON 54

1. 120
2. 100

3. 602
4. 6080
5. 66
6. 2400 sq. ft.
7. 621,736
8. 1000
9. 1024
10. $5600

LESSON 55

1. 1224 bu.
2. 1081
3. 576 qt.
4. 192 pt.
5. 85 bu.
6. $151\frac{11}{20}$
7. $192\frac{3}{16}$
8. $69.09
9. $127.40
10. 112

LESSON 56

1. 896 qt.
2. 214
3. $40.48
4. $1205
5. $316.16
6. $6.50
7. $26\frac{23}{36}$
8. $61.60
9. 158,364
10. $78\frac{19}{24}$

Review XIV

1. $630
2. $2.10
3. $39\frac{1}{4}$
4. $51.80
5. $4488
6. $39.84
7. 120
8. $161
9. 1
10. 10¢

LESSON 57

1. 192 gi.
2. $12.60
3. $2.38
4. 8
5. 115 pt.
6. $3.36
7. 27
8. $39\frac{1}{15}$
9. CMXCVII, DCCLXIV, DCCCII
10. 817

LESSON 58

1. $7.50
2. 85¢
3. 1968
4. 476 gal.
5. $1.92
6. $647\frac{17}{24}$
7. $253\frac{1}{20}$
8. $219\frac{11}{56}$
9. 43,264
10. $20\frac{5}{8}$

LESSON 59

1. Frank 8 in.
2. 164 mi.
3. 1,038,400 yd.
4. 432
5. 675 in.
6. $78\frac{5}{6}$
7. $168\frac{11}{24}$
8. $14.56
9. loss 16¢
10. 8

LESSON 60

1. 7308 in.
2. $4.86
3. 224,568
4. $33.60
5. 6600 ft.
6. $27\frac{1}{72}$
7. $10\frac{28}{45}$
8. 4211 bu.
9. $10.08
10. 1938 sq. in.

Review XV

1. 48
2. 456
3. $91\frac{5}{14}$
4. $55\frac{13}{40}$

5. $81\frac{1}{4}$
6. $12.80
7. 19 mi.
8. 42
9. 320 gi.
10. $60

Review E

1. 36
2. 552
3. 128 da.
4. 36¢
5. 192
6. $9.60
7. $3
8. $225
9. 439
10. $223\frac{11}{70}$
11. $1.17
12. 12 sq. in.
13. 5808
14. $2\frac{2}{5}$
15. $286.20
16. $6.84
17. 72 lb.
18. $315
19. $10.92
20. $14
21. gain $150
22. $40.50
23. $1200
24. 17 mo.
25. $75
26. $24
27. 42
28. $891
29. 11,468
30. $11.
31. $2.84
32. 375
33. 33,703
34. $2279.16
35. 72
36. $19,715
37. 35
38. $4032
39. $1.68
40. $23\frac{3}{4}$
41. 851,002
42. $2.40
43. 58 in.
44. CMXLIV, DCCCLXXI CMLXXX, DCCXCI, DLV
45. 65 ft.
46. 1
47. 38,400
48. 2790
49. 573
50. $73\frac{4}{10}$
51. $34.56

## DRILL ANSWERS

*Multiplication after Review I*

| *A* | *B* | *C* |
|---|---|---|
| 1,546,035 | 922,013 | 6,821,738 |
| 1,069,952 | 1,692,642 | 777,105 |
| 1,051,675 | 1,622,213 | 6,250,272 |
| 2,492,316 | 1,273,704 | 1,908,301 |
| 6,323,562 | 772,254 | 914,312 |
| 706,380 | 839,983 | 8,835,057 |
| 1,970,520 | 309,792 | 529,503 |
| 1,331,858 | 1,261,519 | |

## DRILL ANSWERS—*Continued*

*Multiplication after Review II*

*A*

811,356
2,011,488
30,103,956
2,292,044
3,685,044
3,133,518
3,336,624
1,898,848
3,296,936

*B*

574,369
2,263,329
1,919,526
662,904
765,456
1,916,235
5,528,937
3,504,766
4,794,816

*C*

1,146,530
2,931,328
1,024,632
1,804,151
3,117,902
1,446,705
1,880,434
781,924
1.963,190

*Multiplication after Review III*

*A*

261,608
688,203
283,692
751,842
721,656
407,792
501,462
755,290
797,225
1,052,570

*B*

492,456
389,983
301,693
935,286
413,786
1,039,824
1,349,568
722,088
1,023,990
1,017,632

*C*

395,151
274,288
270,256
515,576
666,308
770,229
1,413,144
1,108,830
1,113,035
829,018

*D*

305,184
722,253
284,348
305,613
750,582
407,814
562,302
778,118
1,329,436
1,194,392

*E*

308,026
473,368
144,982
496,314
753,236
382,602
601,929
590,940
872,249
1,314.132

## DRILL ANSWERS—*Continued*

*F*

494,624
690,116
157,586
687,621
395,604
725,724
434,808
1,010,940
1,489,875
891,572

*Division after Review IV*

*A*

33,204
4329
52,291
48,697
68,439
12,473
5596
12,475
18,574
607,031
21,096
80,097
6025

*B*

307,129
41.205
83,065
123,091
71,709
7169
207,168
49,465
130,816
12,763
21,435
112,853
178,616

*A*

1. 1234
2. 3231
3. 2012
4. 3402
5. 2313
6. 1232
7. 2312
8. 3223
9. 2303
10. 4213
11. 1322
12. 3112
13. 1231
14. 2212
15. 2032
16. 2312
17. 2122
18. 2313

*B*

1. 2312
2. 3423
3. 2122
4. 1323
5. 2331
6. 1221
7. 1322
8. 2212
9. 1021
10. 2121
11. 2332
12. 1122
13. 2132
14. 2012
15. 1102
16. 2211
17. 1221
18. 2122

*C*

1. 2143
2. 3214
3. 2453
4. 3142
5. 3124
6. 3343
7. 2354
8. 4312
9. 4132
10. 3214
11. 3245

## DRILL ANSWERS—*Continued*

12. 2543
13. 2314
14. 3443
15. 5234
16. 3452
17. 1423
18. 2412

*Division after Review V*

*A*

31,206
41,906
836,221
83,751
82,461
15,037
42,583
61,472
49,208

*B*

14,009
83,027
45,703
20,688
49,208
63,551
38,752
40,879

*C*

32,758
91,604
36,594
91,703
20,885
37,095
60,427
70,992

*Addition after Review VI*

*A*

320,925
318,293
460,524
439,828

*B*

417,661
339,938
438,840
980,899

*C*

398,882
362,904
497,876
5,396,381

*D*

352,926
333,345
497,203
$2,034,157.56

*E*

368,992
406,983
454,664
$10,793.79

*Multiplication after Review VIII*

*A*

1. 22,558,452
2. 46,991,560
3. 23,187,915
4. 58,480,488
5. 8,847,888
6. 25,593,892
7. 467,808,102
8. 17,598,936
8. 40,590,795
9. 37,012,764
11. 46,459,935

*B*

2,838,143
2,331,648
1,614,222
6,103,125
4,058,846
6,754,566
8,725,911
3,339,140
6,614,591
4,065,792
4,592,525

## DRILL ANSWERS—*Continued*

*C*

1,662,120
4,505,046
4,021,575
3,521,250
1,148,424
3,328,448
3,695,532
3,046,626
3,548,048
2,178,176
793,072

*D*

1,615,979
1,634,232
2,429,308
2,786,875
2,410,400
5,710,725
4,759,146
3,930,525
3,264,496
2,076,700
573,300

*E*

1,488,522
1,434,222
1,451,208
2,150,622
3,320,326
3,364,026
3,001,389
3,469,768
3,875,452
4,723,452
3,591,563

*F*

3,957,712
6,710,585
3,043,070
2,523,648
6,631,430
5,678,104
2,727,889
1,816,518
3,300,578
1,361,178
3,268,356

*Division after Review IX*

*A*

3426
2453
3654
3654
3546
6453
2453
3124
2134

3425
2653
2465
4213
2436

*B*

3546
4352
3264
1654
3542
3546
6435
3654
2546
5643
5463
4236
4263
4563

*C*

5643
2564
4635
4213
3562
3564
3165
2634
1643

## DRILL ANSWERS—*Continued*

4653
3624
6456
2436
6354

*D*

2536
5654
4653
5643
3652
3564
4653
3605
5064
3264
1653
4635
3465
3426

*Addition after Review XI*

*A*

2,051,514
3,785,940
$15,060.98
3,302,620

*B*

2,037,741
2,836,718
$46,926.85
3,367,072

*C*

364,007
788,938
$1568.17
2,978,035

*D*

1,047,248
1,144,043
$910.28
2,807,886

*E*

387,130
2,254,456
$94,624.51
1,080,743

*Division after Review XII*

*A*

1. 3654
2. 3654
3. 4265
4. 4362
5. 6465
6. 5604
7. 2645
8. 2643
9. 5264
10. 3563
11. 4652
12. 3605
13. 4356
14. 5064
15. 4365

*B*

1. 4652
2. 3645
3. 4652
4. 3651
5. 2164
6. 5604
7. 3652
8. 6254
9. 3256
10. 3265
11. 3651
12. 3465
13. 6523
14. 3625
15. 6513

*C*

1. 6534
2. 3665
3. 1665
4. 2645
5. 4652
6. 3625
7. 3164

## DRILL ANSWERS—*Continued*

8. 2066
9. 2506
10. 2633
11. 3564
12. 2356
13. 2354
14. 4653
15. 3065

*D*

1. 5643
2. 4653
3. 2654
4. 6235
5. 2643
6. 4163
7. 1654
8. 7289
9. 7918
10. 1978
11. 1635
12. 438
13. 396
14. 426 (+782)
15. 750 (+200)

*Fraction Drill III*

*A*

$1\frac{5}{12}$
$1\frac{7}{15}$
$1\frac{1}{2}$
$1\frac{11}{21}$
$1\frac{13}{24}$
$1\frac{5}{9}$
$1\frac{17}{30}$
$1\frac{11}{20}$
$1\frac{7}{12}$

*B*

$1\frac{17}{28}$
$1\frac{5}{8}$
$1\frac{7}{12}$
$1\frac{13}{20}$
$1\frac{19}{30}$
$1\frac{23}{35}$
$1\frac{27}{40}$
$1\frac{31}{45}$
$1\frac{7}{10}$
$1\frac{29}{42}$

*C*

$1\frac{17}{24}$
$1\frac{13}{18}$
$1\frac{11}{15}$
$1\frac{41}{56}$
$1\frac{47}{63}$
$1\frac{53}{70}$
$1\frac{55}{72}$
$1\frac{31}{40}$
$1\frac{71}{90}$

*Multiplication after Review XIII*

*A*

1,070,895
2,400,948
1,541,682
1,879,530
3,433,914
1,742,226
2,089,275

*B*

6,170,463
6,215,622
6,371,783
7,906,986
1,343,076
5,578,248
2,736,855

*C*

2,761,626
3,145,743
8,049,678
5,855,286
8,778,042
7,810,026
6,237,073

*D*

4,752,102
6,178,263
6,069,965
6,725,664
4,178,228
4,442,368
5,884,448

## DRILL ANSWERS—*Continued*

*E*

5,773,250
3,452,430
4,984,875
4,308,472
5,645,059
5,147,403
6,686,113

*Multiplication after Review XIII—Continued*

*A*

5,000,175
6,470,982
2,782,542
2,349,642
3,748,626
4,383,573
5,767,266

*B*

3,450,744
3,076,656
6,461,208
3,849,954
2,289,672
2,878,551
1,546,050

*C*

6,994,332
1,506,246
9,658,782
6,133,662
4,723,743
3,891,048
4,367,493

*D*

6,654,969
5,244,612
3,062,016
4,649,046
5,188,128
5,311,788
5,026,866

*E*

6,439,648
5,066,941
3,825,833
5,297,226
5,244,844
5,954,151
2,572,596

*Division after Review XIV*

*A*

1. 7342
2. 3705
3. 1475
4. 2387
5. 2296 (+609)
6. 4956
7. 2861
8. 5189
9. 4089
10. 2581
11. 3859
12. 4672
13. 8354
14. 9768
15. 9612
16. 3692
17. 3827
18. 5964
19. 6485

*B*

1. 1597
2. 3069
3. 6583
4. 9273
5. 2591
6. 9378
7. 2864
8. 2408
9. 7492
10. 8945
11. 5943
12. 3792
13. 3786
14. 7015
15. 5197
16. 6978
17. 7963
18. 5874
19. 8197

**DRILL ANSWERS—*Continued***

*C*

1. 8971
2. 1798
3. 8279
4. 8279
5. 7928
6. 9782
7. 2978
8. 7298
9. 3978
10. 8937
11. 7398
12. 9783
13. 3798
14. 9378
15. 9748
16. 7948
17. 8479
18. 4897
19. 8794

*Fractions Drill IV*

*Addition*

*A*

$5\frac{1}{4}$
$15\frac{1}{2}$
$14\frac{3}{8}$
$8\frac{3}{8}$
$11\frac{1}{6}$
$12\frac{1}{12}$
$8\frac{3}{24}$
$16\frac{7}{12}$

*B*

$8\frac{1}{3}$
$8\frac{5}{8}$
10
$5\frac{5}{8}$
$9\frac{1}{6}$
$5\frac{3}{36}$
$11\frac{9}{14}$
$6\frac{1}{12}$

*C*

$9\frac{5}{8}$
$8\frac{1}{8}$
$12\frac{1}{8}$
$10\frac{3}{8}$
$12\frac{5}{6}$
$7\frac{2}{3}$
$16\frac{13}{24}$
$8\frac{1}{2}$

*D*

$9\frac{7}{8}$
$12\frac{1}{2}$
$15\frac{7}{8}$
$23\frac{5}{24}$
$8\frac{7}{12}$
$12\frac{17}{24}$
$11\frac{47}{72}$
$7\frac{1}{2}$

*E*

$6\frac{3}{4}$
8

$12\frac{3}{4}$
$7\frac{19}{24}$
$7\frac{7}{12}$
$17\frac{1}{24}$
$8\frac{9}{10}$
$6\frac{5}{6}$

*F*

$5\frac{1}{8}$
$7\frac{7}{8}$
$9\frac{3}{4}$
$16\frac{1}{6}$
$7\frac{5}{6}$
$8\frac{5}{12}$
$10\frac{7}{12}$
$9\frac{17}{24}$

*Subtraction*

*A*

$2\frac{1}{4}$
$8\frac{1}{2}$
$5\frac{3}{8}$
$3\frac{1}{8}$
$6\frac{1}{2}$
$1\frac{5}{12}$
$6\frac{7}{24}$
$1\frac{1}{4}$

*B*

$1\frac{1}{3}$
$4\frac{3}{8}$
$5\frac{1}{4}$

## DRILL ANSWERS—*Continued*

$3\frac{1}{8}$
$2\frac{1}{6}$
$3\frac{27}{56}$
$1\frac{5}{14}$
$4\frac{5}{12}$

*C*

$2\frac{1}{8}$
$3\frac{3}{8}$
$7\frac{5}{8}$
$4\frac{1}{8}$
$2\frac{1}{3}$
$1\frac{1}{3}$
$2\frac{5}{24}$
$2\frac{1}{6}$

*D*

$5\frac{1}{8}$
$1\frac{1}{4}$
$1\frac{3}{8}$
$2\frac{3}{24}$
$4\frac{1}{4}$
$2\frac{1}{24}$
$2\frac{7}{72}$
$2\frac{1}{6}$

*E*

$2\frac{1}{4}$
$1\frac{1}{2}$
$2\frac{1}{4}$
$1\frac{11}{24}$
$1\frac{1}{12}$
$2\frac{17}{24}$
$2\frac{1}{10}$
$4\frac{1}{2}$

*F*

$2\frac{1}{8}$
$3\frac{5}{8}$
$3\frac{1}{2}$
$3\frac{2}{3}$
$3\frac{1}{6}$
$3\frac{1}{12}$
$3\frac{1}{12}$
$4\frac{1}{24}$

*Fraction Drill V*
*Subtraction*

*A*

$1\frac{3}{4}$
$1\frac{1}{4}$
$3\frac{5}{8}$
$1\frac{5}{16}$
$\frac{1}{12}$
$1\frac{19}{24}$

*B*

$1\frac{3}{4}$
$1\frac{3}{4}$
$3\frac{3}{4}$
$1\frac{3}{24}$
$4\frac{5}{6}$
$1\frac{1}{4}$

*C*

$1\frac{5}{8}$
$4\frac{3}{4}$
$4\frac{11}{16}$
$3\frac{7}{16}$
$1\frac{3}{10}$
$1\frac{2}{3}$

*D*

$1\frac{7}{8}$
$1\frac{5}{8}$
$1\frac{19}{24}$
$2\frac{7}{8}$
$\frac{3}{5}$
$1\frac{5}{12}$

*E*

$1\frac{3}{4}$
$5\frac{7}{8}$
$2\frac{17}{24}$
$2\frac{7}{8}$
$1\frac{7}{12}$
$1\frac{5}{6}$

*F*

$3\frac{7}{8}$
$2\frac{7}{8}$
$1\frac{4}{9}$
$1\frac{1}{2}$
$4\frac{35}{48}$
$1\frac{5}{6}$

**DRILL ANSWERS**—*Continued*

*Fraction Drill VI*

| | | |
|---|---|---|
| 48 | 63 | 40 |
| 84 | 18 | 36 |
| 48 | 45 | 48 |
| 32 | 72 | 45 |
| 27 | 9 | 48 |
| 56 | 30 | 36 |
| 12 | 12 | 40 |
| 72 | 18 | 12 |
| 40 | 25 | 35 |
| 35 | 56 | 16 |
| 27 | 16 | 60 |
| 49 | 48 | 18 |